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Mobile Commerce Development in the Czech Republic and the UK

Vývoj mobilního obchodování v České republice a v UK

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 2. Mobile commerce literature review
 3. Methodology of collected data
 4. Research results and analysis of situation in the Czech Republic and the UK
 5. Discussion and recommendations for the next development of mobile commerce and its next extension
 6. Conclusions
- References
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Appendixes

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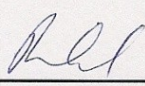
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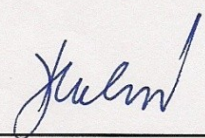
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Prohlašuji, že jsem celou práci, včetně všech příloh, vypracoval samostatně

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jméno a příjmení studenta

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1. INTRODUCTION

1.1. Background of the project

According to observation of Philips (2003 cited in Gay, Charlesworth, Esen, 2007, p6), ‘internet and mobile phones – the two fastest growing communications technologies will make possible all kinds of new services and create a vast new market’. The traditional way of doing business, when the process of selling goods or services is typically taking place in the physical store, is supported nowadays with increasing level of newly adopted technologies, that buyer often do not have to leave his home to make his purchase. Humans are by nature very mobile, aiming to cover new ground and push existing limits. Many activities that we do are dependent on communication and information, which is the key to the social interaction and moreover to decision making process

Mobile phones have been one of the fastest adopted consumer product of all time with over a billion of devices sold worldwide (De Haan, 2000; Emarketer,2002). Other mobile devices such as tablets and laptops are in the past years one of the fastest-growing segments of the computer sector. ‘Their sales have already overtaken those of desktop computers. In a short period of time, tablet sales will even overtake laptop and desktop computer sales together’ (Richmond, 2012). This era in which we are living is making us to be on the go and have our devices ready to use on the land, in the air or on the sea, for purposes such as sending an email, watching movies, reading books and newspapers, downloading music, playing games - simply everything to do with information. The potential of m-commerce is evident from research by ITU (2011) which indicates, that 3G subscriptions grew almost ten times in the four years from the first quarter of 2006 to the start of 2010. ‘There were more 3G mobile cellular subscriptions globally by the beginning of 2010 (667 million) than there were total cellular subscriptions globally at the start of the decade (491 million)’. Mobile broadband subscriptions were set to exceed 1 billion in 2010, with the largest penetration in Europe (ITU, OECD, 2011,p92).

Mobile industry experienced in the year 2011 a cultural change towards media consumption with remarkable rise of sales of smart phones, tablets and similar devices such as Kindle, which are enabling us connect to web. With these in mind, it is becoming mandatory for

businesses to react on the environment changes and adapt new digital marketing strategies and trends which are currently shaping the mobile environment. (comScore, 2012)

1.1.1. Project location

Considering the fact that my research will focus on studying mobile commerce development in the Czech Republic and the UK, I cannot ignore a general overview of both countries. It will provide readers with their basic factual comparison.

Czech Republic:

The Czech Republic is a landlocked country with neighbouring countries which you can see in figure 1. It has a rich history, from which it is at least appropriate to mention ‘velvet divorce’, when in 1993 Czechoslovakia peacefully dissolved into two states. The country is a pluralist multi-party parliamentary representative republic with developed economy and a



Figure 1: Czech's adjacent countries (Source: News.bbc.co.uk, 2011a)

rich cultural heritage. ‘It emerged from over 40 years of Communist rule in 1990, and was the first former Eastern Bloc state to acquire the status of a developed economy’ (News.bbc.co.uk, 2011a). It joined the European Union in 2004 and it is a member of other important institutions such as NATO, OECD, Visegrad Group. In tables 1 and 2, you can find basic data about the Czech Republic and the UK for better comparison of these two countries.

Table 1: Basic data about the Czech republic (Source: News.bbc.co.uk, 2011a)

Population: 10.4 million (UN, 2010)	Area: 78,866 sq. km (30,450 sq. miles)
Life expectancy: 75 years (men), 81 years (women) (UN)	Monetary unit: 1 koruna (Kc) = 100 halers
GNI per capita: US \$17,890 (World Bank, 2010)	Internet domain: .cz International dialling code: +420

In the same way as above, in the following paragraphs you can find information about the UK. Afterwards in the next part, there will be a description focused on the telecommunication sectors in both countries.

The United Kingdom of Great Britain and Northern Ireland

The United Kingdom is made up of England, Wales, Scotland and Northern Ireland as noticeable at figure 2. 'It has a long history as a major player in international affairs and fulfils an important role in the EU, UN and NATO' (News.bbc.co.uk 2011b). It is a unitary state governed under a constitutional monarchy and parliamentary system. It was the first industrialised country, however 'the two world wars and the end of empire diminished its role, but the UK



Figure 2: UK's location (Source: News.bbc.co.uk 2011b)

remains a major economic and military power, with considerable political and cultural influence around the world'. Its role as a member of all influential organisations is indisputable.

Table 2: Basic data about the United Kingdom of Great Britain and Northern Ireland (Source: News.bbc.co.uk 2011b)

Population: 62.4 million (UN, 2011)	Area: 242,514 sq. km (93,638 sq. miles)
Life expectancy: 78 years (men), 82 years (women) (UN)	Monetary unit: 1 pound sterling = 100 pence
GNI per capita: US \$38,370 (World Bank, 2010)	Internet domain: .uk International dialling code: +44

1.1.2. Overview of the telecommunication sectors

Czech telecommunication market

According to the Czech statistical agency (CSU, 2009), in the Czech Republic, the development of mobile networks started slightly later than in the UK. In 1991, Eurotel launched a network of the first generation. This network was in 1995 covering nearly 50% of the territory. With the year 1996, began the development of the GSM network and company Radiomobil entered the market, with a launched GSM network called Paegas. The first SMS that users were able to send from a mobile phone was in January 1999.

In 2000, the third mobile operator Oskar entered the market. In the same year Eurotel launched GPRS network, which was followed a year later by Paegas. At this time, there was

an absence of mobile phones in the market. At the end of 2001, Eurotel and Radiomobil purchased a license for third generation networks. In the same period, Paegas transformed itself to T-Mobile which is currently operating under this name. A year later commercial service of the MMS started and in 2004 T-Mobile launched EDGE network.

Oskar bought a license for the third network generation UMTS and subsequently was sold to multinational telecommunications company Vodafone in 2005 which is in the Czech market until now. In the same year, Spanish Telefónica became the owner of Eurotel and together with T-Mobile they began running simultaneously a UMTS network.

Future

In the near future, the expectation is to implement the network of fourth generation - LTE, which is seen as the standard for Europe. The fact that the Czech Republic mobile networks evolved at a rapid pace is evident in the graphs in appendix 1.

During 2011 the mobile operators and the regulator - the Czech Telecommunications Office were attacked with strong criticism. There are big changes expected in the year 2012, interrelated with a tender for free frequency, which is held in the spring. A fourth operator should come to unleash a price war, or so-called 'digital dividend' will be shared by the existing operators (CTU, 2012). CTU Council members agreed that the greatest attention and expectations will be focused on the open auction of frequencies. 'It aims to develop the competition and ensure for citizens and entrepreneurs in the Czech Republic great mobile broadband services, especially high-speed mobile Internet, in a relatively short time'. According to developed criteria, in three years time most of the CR should be covered by mobile broadband 4G technology and be available for more than 90% of CR citizens (CTU 2011).

English market overview:

In the UK we can choose from five main mobile network operators: O2, Orange, T-Mobile, Vodafone and Three. I will write a short description about each history and development within the area.

First of all, O2 belonged to a mobile communication division of British Telecom (BT). 'Then, as its subscriber base began to grow, was rebranded as Cellnet'. Cellnet was in 2002 acquired by Spanish Telefonica and rebranded as the O2. The network achieved global fame when,

back in 2007, it won the exclusive rights to sell Apple's first iPhone in the UK. (Mobilechoices, 2011)

Orange is owned by France Telecom, which operates in numerous countries all over the World. The firm's UK division has passed through a range of mergers and acquisitions. According to Mobilechoices (2011) 'Orange was once owned by rival network Vodafone when, in February 2000, Vodafone acquired Orange's holding company - Mannesman. However, Vodafone wasn't allowed to own two mobile phone licences in the UK and so later sold Orange to France Telecom'. Orange's UK division merged with Deutsche Telecom - the owner of T-Mobile - in 2010 and the pair are now run by holding company Everything Everywhere, while still retaining their own brand names. (Everythingeverywhere 2011).

'T-Mobile UK started operating under the name Mercury One2One, the world's first GSM 1800 mobile network'. Similarly to Orange, T-Mobile's was hold in hands of several companies (Mobilechoices, 2011).

'The first mobile phone call made in the UK was over the Vodafone network back in 1985'. Over the years Vodafone has scored other numerous mobile-related achievements such as being one of the first networks to make a 3G telephone call in the UK and the creation of pay as you go billing in 1998. While most of the major mobile networks still send telephone calls and mobile internet data over a mixture of 2G and 3G signals, Three is the UK's first 3G-only mobile network. (Mobilechoices, 2011)

Virtual mobile networks:

Other UK mobile networks do exist as well, their mobile phone signals are provided by the major operators what you can see in table 3. This helps the smaller networks keep their set-up and operating costs down. However they can't always provide the strength and range of signals that their major rivals can.

Table 3: List of virtual operators with information about the infrastructure they use (Source: Ukmobilecoverage.co.uk, 2009)

VIRTUAL OPERATOR	NETWORK INFRASTRUCTURE
Virgin Mobile	T-MOBILE
Tesco Mobile	O2
Blyk	ORANGE
Vectone	T-MOBILE

LycaMobile	ORANGE, O2
Talkmobile	VODAFONE
BT Mobile	VODAFONE
ASDA Mobile	VODAFONE
Abica	THREE, ORANGE, T-MOBILE
Lebara Mobile	VODAFONE
Giff Gaff	O2
Family Mobile	T-MOBILE

Future:

Ofcom (2011) the UK regulator, is allowing phone operators to trade spectrum in a move aimed to expand mobile network capacity. The trading of spectrum comes before a crucial auction scheduled in 2012 that will bring in 4G data services.

Ofcom had initially intended to redistribute the spectrum allocated to Vodafone and O2 but the two operators initiated legal action against Ofcom. The regulator decided to drop its plans after the merger of Orange and T-Mobile's UK businesses. The parent firm of Orange and T-Mobile in the UK, Everything Everywhere, is expected to be the biggest beneficiary of spectrum trading. (Bbc.co.uk, 2011)

Four main UK operators promise technology for quick adoption of mobile wallet and payments. Everything Everywhere, Vodafone UK and Telefónica UK are planning to launch a standalone m-commerce joint venture before 2011-end. The joint venture, which is subject to competition approval, will offer the technology for fast adoption of mobile wallet and payments. Users will be able to transfer their entire physical wallet into a new secure, SIM-based wallet regardless of which mobile network or NFC enabled mobile device they are using. As well as for Czech Republic, in appendix 3 there are graphs which shows actual telecommunication's market situation for UK (Globaltelecomsbusiness.com, 2011)

1.2. Literature, purpose and structure of the research

1.2.1. Overview of used resources

The theory on M-commerce is not that large-scale since the available technology is relatively new and constantly evolving. The adoption rate and evolving technology in past years extends the reach of M-commerce. Ngai and Gunasekaran (2007) divide mobile commerce research into three interrelated categories:

- technology,
- theory and research,

- applications.

As Figure 3 illustrates, technology in the centre, forms the base by which both theory research and applications are supported. On the top of this composition are the applications for which this technology is used. Theory acts as a guide that links the available technology with the actual applications. In addition it provides regulation basis on when in practice, which technology should be used (Mennecke and Strader, 2003). This framework is additionally supported by research of Varshney and Vetter (2001) who published this ‘four-level integrated model for m-commerce’:

- m-commerce theory,
- wireless user infrastructure,
- mobile middleware,
- wireless network infrastructure.

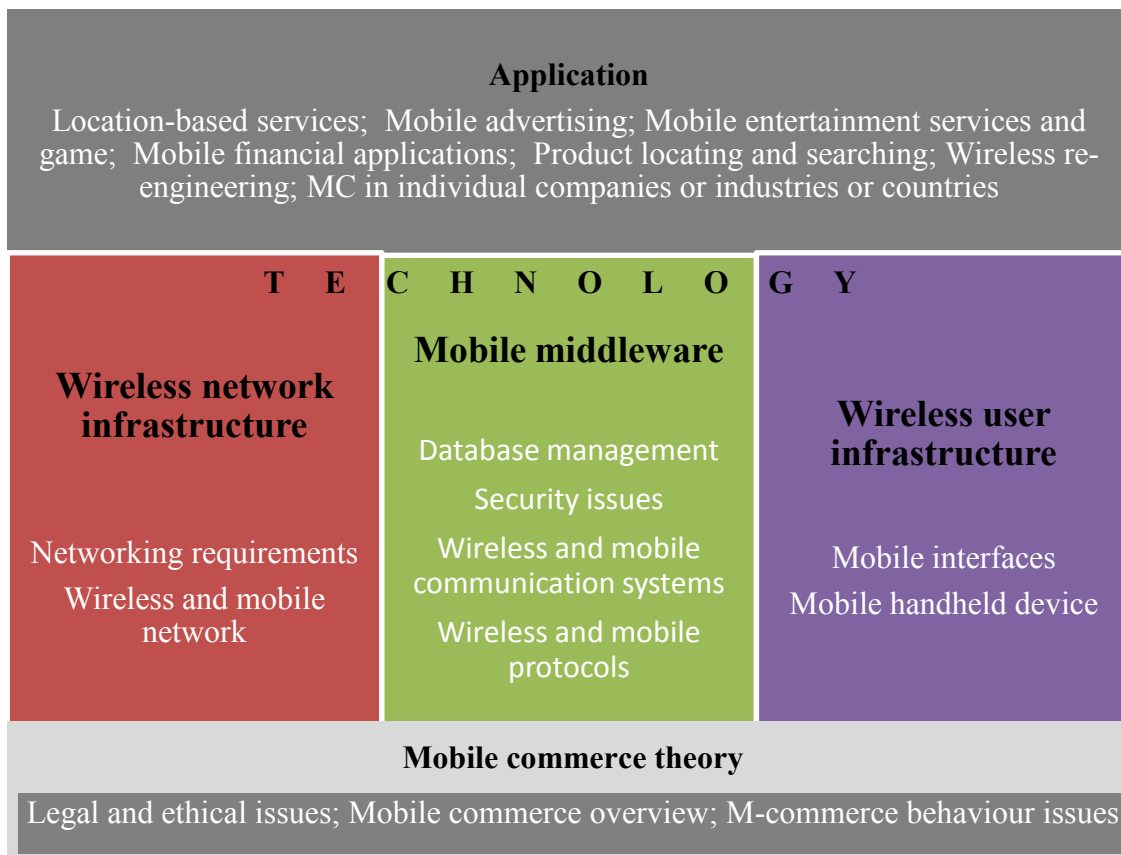


Figure 3: Model for mobile commerce literature research (Source: Varshney and Vetter, 2001; Mennecke and Strader 2003; Ngai and Gunasekaran, 2007)

As reported, for m-commerce applications is essential the support of technology. I was taking this into consideration when doing my literature review. In research undertaken by Ngai and Gunasekaran (2007), mobile commerce articles available consist of five levels and each of them can be defined as follows:

M-commerce theory is the lowest level of the structure. The articles in general describe the ‘development of m-commerce applications, behavioural issues such as consumer behaviour, the acceptance of technology, and the diffusion of m-commerce applications and services’. Further to, economical and strategy issues and business models extended by legal and ethical matters of m-commerce are included to this as well. In a matter of fact, this area theoretically supported main part of my literature review.

The next important area, which is covered by a large number of articles, is **Wireless network infrastructure**. ‘This is one of the pillar technologies of m-commerce that supports the development of m-commerce applications. Wireless network infrastructure plays an important role in m-commerce as this is the core part of m-commerce technology’ (Staton, 2001, Ngai and Gunasekaran, 2007). It provided me with knowledge about the wireless networks and network standards.

“The software layer between the operating systems and wireless is referred as **Mobile middleware**” (Varshey, Vetter, and Kalakota, 2000). Because the literature review has its limits according to the content, this area won’t be described in as much detail.

Wireless user infrastructure consists of both - software and hardware. Software refers to the operating systems and their interfaces while hardware means the mobile devices such as mobile phones or tablets, which are used to communicate with the particular applications. Publications concerning mobile interfaces discuss interface design or issues relating to the mobile applications or devices. In the literature review It is important to focus on well-designed and useable interface to achieve success in a mobile environment.

Mobile commerce applications theory ‘covers a extensive range of applications and defines some important classes of m-commerce applications: financial applications, location-based applications, pro-active service management, mobile auctions, mobile entertainment services and games, mobile offices, mobile distance education, and wireless data centres’’ (Ngai and Gunasekaran 2007).

1.2.2 Purpose of the research

The focus of this paper is to analyse the level of mobile usage in the Czech Republic and compare the actual situation within the UK area. My next aim is to investigate the popularity of m-commerce in buying and selling goods and services. Additionally, I want to present the possible benefits of the implementation of this technology.

At the next stage, the study will scan opportunities and factors which helped to develop mobile commerce in both regions. Additionally to this, I will discuss the challenges and barriers that people usually face with. As a result of an electronic survey, the study also aims to provide analysis of the user satisfaction and the kind of problems they normally meet when buying and selling goods and services. The last aim of the study is to identify future trends in how mobile commerce will evolve.

I will also cover areas like security and reliability to propose how to improve customer experience. The overall goal of this study is to provide a conclusion on m-commerce in both countries, what should provide a blueprint for future researches, because of relatively new adaptation of these services and as well the lack of studies in this area of business in the Czech Republic.

1.2.3 Research questions

My work will concern three main areas: geography, mobile commerce and provide results and recommendations for small business enterprises in this area of retailing. Trying to cover all of these aspects of m-commerce in relation to my geographical implementation of work, and future changes, I formed three main research questions:

- 1. The level of mobile usage in the Czech Republic and the UK*
- 2. Investigate the popularity of Mobile commerce in buying and selling goods and services*
- 3. Identify future trends in how mobile commerce will evolve*

1.2.4 Structure of the study

“Mobile commerce literature review” of this thesis is based on the academic literature stated above. The empirical studies were conducted as both qualitative and quantitative research, with a consumer survey conducted with 211 participants. This will be more described in

chapter three - “Methodology of collected data”. In this part of my work I also explain the methodology which is used to collect the data. “Research results and analysis of situation in the Czech Republic and the UK”, as a title is already telling, I will analyse the collected data and state the findings, whereas in the fifth chapter “Discussion and recommendations for the next development of mobile commerce and its next extension” I will discuss the findings and the key success factors of developing mobile commerce. Finally, by analysing and discussing the data collected, the study concludes by giving recommendations for the next direction of mobile commerce in both regions.

2 MOBILE COMMERCE LITERATURE REVIEW

2.1 Mobile commerce overview

2.1.1 *Defining the term*

The simplest definition of the term m-commerce wrote Mennecke and Strader (2003) - “Buying and selling goods and services by wireless handheld devices like mobile phones and personal data assistants.” Durlacher (1999) deploys this explanation “any transaction with a monetary value that is conducted via a mobile telecommunication network.” Lehner and Watson (2001, p1) additionally comment: ‘Similar to traditional definition of e-commerce, the focus lies on the exchange of products and services that is associated with a monetary value’. The difference is in terms of the used technology - mobile telecommunication networks substitute the Internet as the underlying driver and enabler.

While we can find a variety of similar definitions, Skiba et al. (2000) take a different view and offers the definition that m-commerce is “the use of mobile hand-held devices to communicate, inform, transact and using text and data via connection to public or private networks”. These definitions, formulated in the first stage of m-commerce, must be little bit re-interpreted. Authors in their works disregard ‘telematics’ (services such as satellite navigation in vehicles) as an important part of m-commerce, articles in this period of time provide a insights to basic understanding of m-commerce. As a most appropriate I refer to Tiwari, Buse and Herstatt (2006, p2) who identified m-commerce as “any transaction, involving the transfer of ownership or rights to use goods and services, which is initiated and/or completed by using mobile access to computer-mediated networks with the help of an electronic device.”

In order to better realise the coherence of e-commerce and m-commerce it is important to define at first terms electronic business (e-business) and mobile business (m-business). To make it clear, I will start with basic definitions such as commerce and business, mobile and electronic, and I will be highlighting the main differences.

Commerce versus business

The term ‘commerce’ refers to “the sale and purchases of goods and services in both business and consumer segments and to activities directly related to such transactions. Examples of such activities are marketing measures or after-sales services”. By contrast, ‘business’ refers to “all activities undertaken by a firm in order to produce and sell goods and services. These activities are, thus, not exclusively of a ‘commercial’ nature, because they include other

processes such as procurement, production, customer relationship management and human resources management” (Tiwari, Buse and Herstatt, 2006, p3). Commerce is ergo seen as a subset of the broader term business. Equally to this approach, e-commerce is correspondingly seen as an integral subset of e-business.

Electronic versus mobile

The adjective ‘electronic’, used within the specific contexts of ‘e-business’ or ‘e-commerce’, signifies an ‘anytime access’ to business processes. (Tiwari, Buse and Herstatt, 2006, p3) . Referring to electronic the meaning of access to computer network is ‘stationary’ and therefore the services are dependent on the current user’s geographic location what is illustrated in figure 4. The term “mobile”, used within the specific contexts of “m-commerce” or “m-business”, signifies an “anytime and anywhere access” to business processes. The access takes place using mobile communication networks, making the availability of these services independent of the geographic location of the user (Hohenberg and Rufera, 2004).

M-commerce is strongly associated with e-commerce, since the services are processed electronically by fixed networks and also via telecommunication networks. The only difference is accessibility, in terms of utilisation of the mobile device to use the service through telecommunication networks. Tiwari, Buse and Herstatt (2006, p6) developed two paradigms covering the relationship of m-commerce to e-commerce and both of these approaches are in principle right. The first paradigm ‘classifies m-commerce simply as an extension of e-commerce’; the second paradigm ‘regards m-commerce as an independent business field and consequently as an alternative mechanism to e-commerce’.

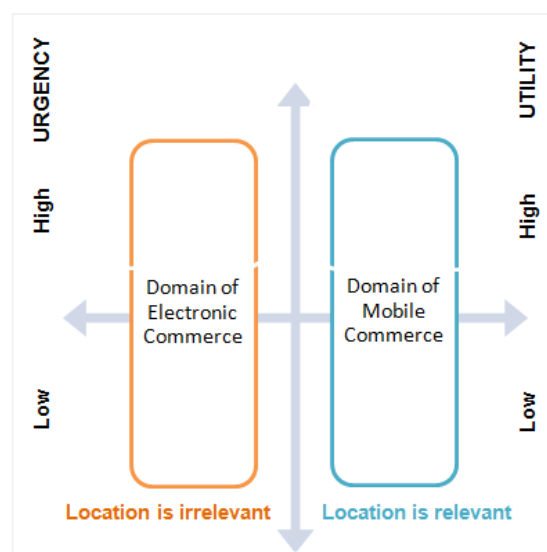


Figure 4: Domain of M – commerce
(Source: Hohenberg and Rufera, 2004)

In the information society, a man is becoming passive driven consumer of information what is allowed by the new technology. However on the other hand it allows him as well to become their active producer. ‘This convergence of information, communication and multimedia

technologies, create new business opportunities in the upcoming decades which play a key role in the economy and public life'. (Tvrdikova, 2010)

Although we can think that Internet alone is already breaking down the location barriers, there is still this paradox of 'fixed-line electronic commerce'. These traditional e-commerce services are not always available in the location where the user needs them. We often have to simply find place to connect us to fixed network in the office, internet café or the university computer room. This and other characteristics of m-commerce I am going to comment in the following chapter where I take look on 'Aspects of Mobility'

2.1.2 Aspects of mobility

Mobile commerce grows rapidly hand in hand with the development and expansion of the broadband mobile networks. Mobile devices becoming more advanced and with decreasing differences between mobile communication technologies and static internet broadband, they are becoming more popular across the users. Services which few years in the past were bounded to a several categories such as: "ring tones, wallpapers, weather forecasts, short news services, games and other kinds of 'light' entertainment, has now expanded to a broad variety of highly advanced multimedia services very similar to 'conventional' e-commerce" (Jakobsen, 2011).

In the work of Mahatanankoon, Wen and Lim (2005) are reviewed four main aspects of mobility in m-commerce applications and operations. Mobile phone was in its basic essence designed to be 'always **on**' meaning to be portable and users usually do not tend to turn off their cell phones. This allows us to conduct services by using Internet simultaneously when we are working or travelling and next advantage is, that it takes less time to power up cell phone battery comparing to laptop. Secondly, the characteristic of mobile phones is a '**location centric**' technology, which can provide the user with personalised services according to their current location received from the GPS.

Mobile phones can be better penetrated by wireless service providers using their current location and resulting to more effective and efficient advertising and targeting the right segment. 'M-commerce producers can be more creative and customisable in designing lifestyle tools' (Mahatanankoon, Wen and Lim, 2005). And finally, most of mobile devices are also '**identifiable**' what is allowed by built in ID support such as SIM card identification

and IMEI of the phone. Services provided by most of the manufacturers include tracking tools as a standard in the case if the mobile phone was lost or stolen.

2.2 Development of mobile commerce technologies and its framework

2.2.1 Wireless infrastructure and protocols

These paragraphs describe the wireless technologies that are available and in actual use during the writing of this thesis. The wireless technologies listed below gives knowledge of the connection between the mobile phones and applications designed to access the information channel.

The architecture of the mobile phone network and the capabilities of mobile phones have evolved tremendously since the first-generation phones were introduced in the 1980's. The first generation mobile phone systems transmitted voice calls as continuously varying (analog) signals rather than sequences of digital bits. 'Advanced Mobile Phone System, which was deployed in the United States in the 1970's, was a widely used first generation system (Tanenbaum, and Wetherall, 2011). Second-generation mobile phone systems switched to transmitting voice calls in digital form to increase capacity, improve security, and offer text messaging. Global System for Mobile communications (GSM) was deployed starting in 1991 and has become the most widely used mobile phone system in the world (Laudon and Traver, 2011).

Wireless Application Protocol (WAP) offers the facility to access information on websites that has been specially tailored using Wireless Markup Language for small screens of mobile phones. 'When first introduced around 2000, levels of products purchased by mobile phone and content access proved was very low in comparison with Internet', even for standardized products such as CDs or books (Rask, Dholakia and Dholakia, 2006).

Term '3G' stands for 'third generation network', which allowed high speed data transmission and new multimedia services such as video calls. 'This network's protocol is not IEEE 802.11 (protocol used to ensure easy and efficient access to a computer network), but it is a network designed for personal devices like mobile phones' (Tanenbaum and Wetherall, 2011,pp). I will just shortly again mention already demonstrated in ITU statistic, "3G subscriptions grew almost ten times faster in the last four years from the start of 2006 to the start of 2010 (ITU, OECD, 2011).

Fourth generation networks are still under development; their arrival was expected in 2010, but the level of broadening vary from country. ‘Long Term Evolution - LTE is the next step for many already on the GSM technology curve and for others, such as CDMA operators. LTE-Advanced extends the technological principles behind LTE into a further step change for faster mobile broadband and additional innovations’ (Gsmworld.mobi 2009). A number of LTE implementations have been completed and a number are planned. Mobile broadband speed (in appendix 3 table with comparison of networks parameters) influences usage, with faster speeds supporting more widespread take-up. This mobile broadband network will provide the highest yet realized data rates with the best interactivity and quality. (OECD, 2011)

There is a common goal across the countries in Europe, Asia and North America, to roll-out a NGA network, but each region has taken different approaches in order to reach this state. Outside the Europe, ‘NGA regulatory frameworks are being designed as part of the process of deciding how much public funding to invest in NGA networks’. European countries decided that ‘public investment remains largely the responsibility of EU Member State governments, although the European Commission has a role to play in promoting the consistency of regulatory approaches across Member States’. European Commission published in September 2010 an NGA Recommendation and is as well supporting the Commission’s ambitious Digital Agenda targets that, ‘by 2020, every EU citizen should have access to 30 Mbps, and 50% should have access to 100 Mbps’. (Ofcom, 2011)

Published in White Paper of NGMN Alliance (2006), figure 5 illustrates the overview of the technologies in the timeline from 1990 until the close future. What is noticeable in this figure is the coexistence of different technological solutions, and need for its standardisation.

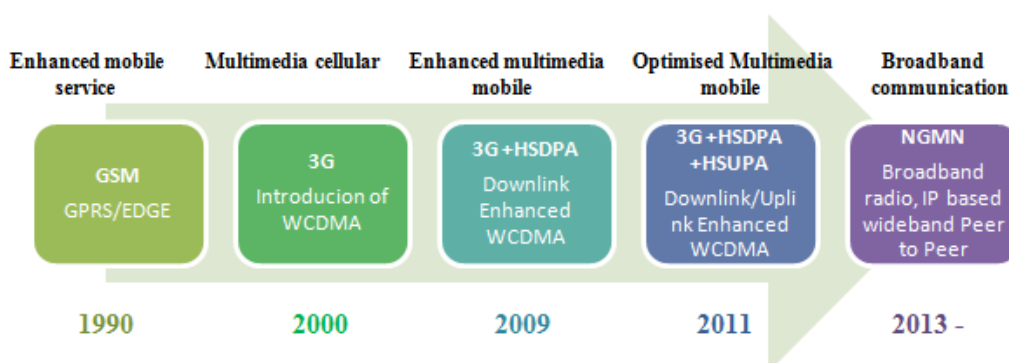


Figure 5: GSM-UMTS-NGMN coexistence (Source NGMN Alliance, 2006)

2.2.2 The framework of mobile commerce

There are complex processes in progress, when speaking about Mobile commerce environment. I will not describe every single entity of value chain in detail, but I address them briefly in table 4.

This framework was proposed in work of Hu (2009, p75) and according to author “it allows developers and providers to strategise and effectively implement mobile commerce applications”.

Table 4: The value chain of m-commerce (Source: Hu, 2009)

Mobile network operators	<i>Their role is to provide network coverage across the countries by creating a billing relationship with themselves and customer.</i>
Network equipment providers	<i>Here belong companies which provide special equipment for running a mobile or Wi-Fi network.</i>
Device manufactures	<i>All companies that manufacture the mobile devices such as mobile phone, tablet, GPS</i>
Technology platform vendors	<i>Companies which core business is to design or create operating systems and other software platforms.</i>
Wireless internet service providers	<i>Main purpose of these companies is to provide user with the Internet access either through wireless local area networks or mobile networks.</i>
Wireless application service providers	<i>“They host wireless applications for companies that wish to conduct m-commerce activities but do not have the necessary resources”.</i>
Application developers:	<i>People who are programming apps, which can run under selected operating system</i>
Content providers	<i>They provide customer with content he wish to deliver. This content is gained from news agencies, entertainment companies, or stock exchanges.</i>
Mobile portal providers	<i>“The mobile portals act as entry points to a wide spectrum of content and services. They can be content-oriented; communication-oriented or commerce-oriented”.</i>
Trading companies	<i>Companies which carry out the mobile commerce activities</i>
Consumers / User	<i>“The target audience of the m-commerce is the consumers, which are individuals, companies or business customers.”</i>

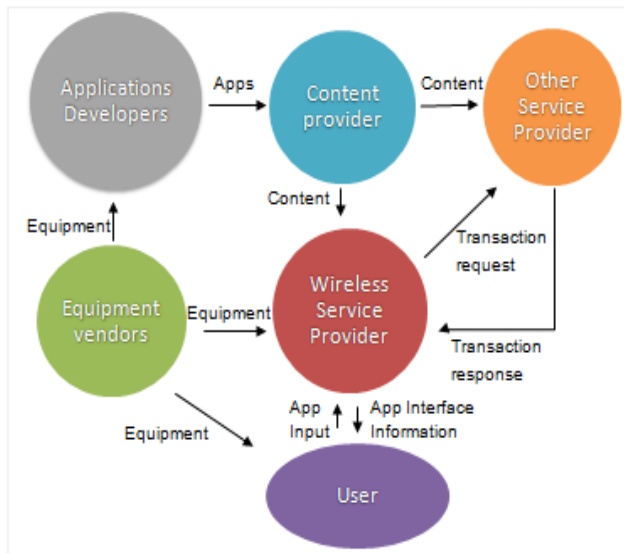


Figure 6: Mobile Commerce Life Cycle
(Source: Varshney and Vetter ,2001)

This framework reflects the fact, when a developer is designing a mobile device application, he has to first think on opportunities or threads of whole user infrastructure, not only the individual device. The authors also conclude that the framework “provides a developer and provider with plan to address the different needs and roles of application developers, content providers, and service providers.”

In order to have a comprehensive view of the framework, I provide reader with figure 6 where we can see these players and their possible interaction (Varshney andVetter 2001).

2.3 Implementation of mobile commerce

In this part of the paper I will introduce in general, the categories of the mobile applications which have the future potential, and which I was taking into account when designing my questionnaire. Before moving to the applications let me write a few words according to changes in the retail environment. It is noticeable that the process of disintermediation is making significant changes to behaviour of consumer. Due to this, customers increased their buying power. Now they can compare product prices and features and order goods online 24/7 bypassing limited local offerings and saving significant amount of money. Purchase can be made from home, office, through mobile phone or similar device and it is not a big challenge to collect deep information about particular product through accessing medical information, consumer reviews, newspapers, dictionaries or other sources in practically every language. With Internet services it is possible geographically reach customers – inform and promote product worldwide. On the other hand for retailers there are better options to collect more specific information about customer’s purchases, demographics, preferences and profitability. (Keller and Kotler, 2012)

2.3.1 *Buying decision process*

It will be helpful to start this chapter with a short description of consumer's behaviour when buying and selling goods, what is one of three main question of my research. We can look at the problem in two other ways, specifically - as an economical or psychological model. However, I decided to describe five-stage-model for the buying decision process, suggested by Keller and Kotler (2012), which can be used to understand this important know-how visualised in the figure 7:

A) Recognising the problem

It is a need that can be met acquiring a good or a service. Stimuli can be either external or internal.

B) Information search which can be supported as well with seeking for a right supplier

Customers can have two different attitudes according to the search - 'heightened attention' when they are just receiving information or 'active information search'. Consumer can seek the information within his family members – personal; by accessing Internet or other media – commercial, which was considered as the most truthful, and now becoming important as the Web is becoming more social; or conducting public and experimental research.

C) Evaluation of alternatives

Keller and Kotler, 2012 claim that any process of customer decision is alike but we can use available models to support these. It always depends from the customer's beliefs and attitudes, his actual state - feelings or emotions which can change his behaviour.

D) Decision

Customer has already preferences among the available products. As a support, Keller and Kotler, 2012 outline five sub-decisions: 'brand, dealer, quantity, timing, and payment methods'. These factors are becoming less considered when the purchase is becoming more common. The most considerable thing in connection to mobile commerce services is that consumer is always trying to avoid risk, and then decide to use only service which he can trust.

E) Behaviour after purchase

“If the performance meets or exceeds expectations the consumer will be satisfied, if it does not, the consumer will be dissatisfied.” This satisfaction or dissatisfaction will further influence the probability of their return business as well as their perceptions of the brand.

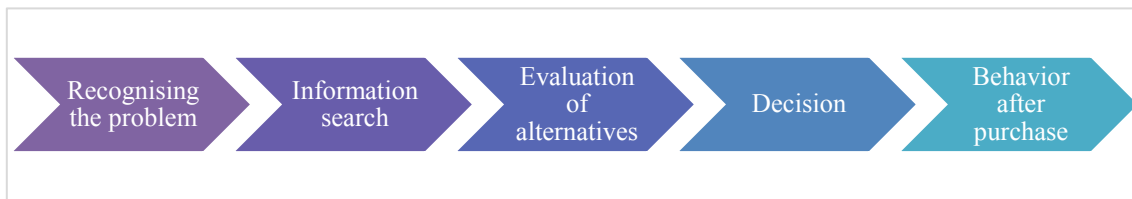


Figure 7: The buying decision process (Source: Keller and Kotler, 2012)

2.3.2. *Mobile commerce services categories*

A few of the existing e-commerce services can be successfully expanded to changing mobile environment. New services will arrive built by the technology speed-up and changes in configuration of mobile devices. Below is a list of several characteristics in which m-commerce services hold advantage against its traditional forms (Durlacher, 2000; Andreou, et al. 2002; Benou and Bitos, 2008; Tiwari, Buse and Herstatt, 2008):

Context-Sensitiveness: “Ability of the mobile applications to sense and exploit the context in order to offer personalised, localised and generally purpose-suitable services” (Benou and Bitos, 2008).

Convenience: It is easy to set up the accounts, interact with the services. We do not need to connect anything and it is according to the size very carry able.

Localisation: Meeting customer needs through services specific to the user location offered by GPS technology.

Personalisation: Application can be personalised according to consumer wishes, which as well depends on selected operating system

Pro-active functionality: Ability to provide user with crucial information in the right time

Reach ability and Immediacy: Similar to ubiquity – useful real-time services which capture customer at the moment when he feels a need

Simple authentication procedure and Instant Connectivity: fast and easy accessibility to Internet services

Ubiquity: Regardless to location - advantage of a mobile device to be available at almost everywhere, anytime

May (2001, p8) argues that labelling the mobile ‘services’ with the term applications is inappropriate. I am using this term mobile applications in the dissertation often and I do not think that it is wrong. Looking at the definition that ‘application has an demarcated set of functionality designed for a known or ideal user group’ we can see that this is already happening and mobile services in their pure form such as voice, messaging, or content

readers have moved forward in the past 10 years. We can divide this endless list of mobile commerce applications to a few classes as shown in table 5. Andreou, et al., (2002) define that we can classify these services as either a ‘directory oriented’, which provide us with information such as location, newsletter and message. The second category is services ‘transactional oriented’ these allow us transaction through mobile devices. Services evidently do not have to be designed purely for phone but include as well the use of tablet, car appliances, home entertainment and similar mobile devices.

Table 5: Details and examples of mobile commerce applications (Source: Varshney and Vetter, R, 2002)

Class of application	Details	Examples
Mobile financial applications	Applications where mobile device becomes a powerful financial medium	Banking, brokerage, payments
Mobile inventory management	Applications attempting to reduce the amount of inventory needed by managing in-house and inventory-on-move	Location tracking of goods, boxes, troops and people
Product locating and shopping	Applications helping to find the location of product and services that are needed	Finding the location of a new/used car of certain model colour and features
Proactive service management	Applications attempting to provide users information on services they will need in very-near-future.	Transmission of information related to aging (automobile) components to vendors
Wireless re-engineering	Applications that focus on improving the quality of business services using mobile devices and wireless infrastructure	Instant claim-payments by insurance companies
Mobile auction or revenue auction	Applications allowing users to buy or sell certain items using multicast support of wireless infrastructure	Airlines competing to buy a landing time slot during runway congestion
Wireless data centre	Applications supporting large amount of stored data to be made available to mobile users for making ‘intelligent’ decision	Detailed information on one or more products can be downloaded by vendors
Mobile office	Applications providing the complete office environment to mobile users anywhere anytime	Working from traffic jam, airport and conference
Mobile advertising	Applications turning the wireless infrastructure and devices into a powerful marketing medium	User specific and location sensitive advertisements
Mobile distance education	Applications extending distance/virtual	Taking a class using streaming

Mobile entertainment services and games	education support for mobile users audio and video everywhere
	Applications providing the entertainment Video-on-demand, audio-on-services to users on per event or demand, interactive games subscription basis

2.4. Regulatory framework of m-commerce

When talking about the usage of mobile devices, I must mention the importance of security issues. Organisations have to balance the risks by increasing information protection. According to Wirtz (2001) cited in the article by Tiwari, Buse and Herstatt (2006) M-commerce, similarly as an e-commerce, ‘requires transparent and clear regulations as the contracting parties do not necessarily know each other and there is hardly, if any, face-to-face contact while negotiating an agreement’. As he further alleges, ‘this anonymity makes many potential customers suspicious of electronic transactions’. These transactions are covered by E-commerce regulatory law, as well as complemented by telecommunications’ regulations in each country. How strong these regulations are, differs across states, but the origins are mostly derived from European Union directions or law is based on WTO, OECD or WIPO frameworks.

As we can record the increasing numbers of Internet subscribed users, it is essential to create new secure mobile solutions. Reported in the press release by Gartner (2011) until the end of the year 2013, ‘location or profile information from mobile phones will be used to validate 90% of mobile transactions’. ‘This adoption of smart phones is forcing banks, social networks and other e-commerce providers to implement the kinds of fraud detection capabilities that have become mainstream with fixed-line computing’.

Framework of law in the EU

Law of the EU institutions is covering e-commerce security by European Union directive, 2000/31/EC. It contains 12 directives focusing on the regulatory framework for ‘legally-binding electronic contracts, determination of jurisdiction, consumer- and data protection, protection of intellectual property rights (IPR), dispute resolution, cyber crimes and taxation regimes among others, to ensure legal certainty’. Tiwari, Buse and Herstatt (2006) are additionally stating: ‘the role of the mobile operator becomes more equal to the role of the traditional Internet service provider and the issue of ‘ISP liability’ becomes very important. Intermediary Service Provider (ISP) liability for illegal content’ is defined in the E-Commerce

Directive Articles 12-15' (Jakobsen, 2011). 'Leading European operators signed a European framework agreement, based on good examples of self-regulatory codes which already existed in some Member States' (Reding, V., 2008). This was aimed to make the usage of mobile phone safer especially for young people, because they can easily become an object of cybercrime or similar criminal activity.

Next, activities and EU's legal actions are visualised in the table in appendix 4. The last activity proposed by the European commission was 'to establish a European Cybercrime Centre to help protect European citizens and businesses against mounting cyber-threats'. The centre's focus will be in 'illegal online activities carried out by organised crime groups, particularly those generating large criminal profits, such as online fraud involving credit cards and bank credentials' (EU commission, 2012).

2.5. Mobile commerce globally

Before moving to the analysis of results of my questionnaires, I would like to draw attention to a situation in both countries, which relates to leaders in this area of commerce and where the UK and in the Czech Republic should aim towards. According to Canalys (2012) statistics, we can notice in figure 8 one notable result, that 'total annual global shipments of smart phones exceeded those of client PCs (including pads) for the first time'.

Category	Q4 2011 shipments (millions)	Growth Q4'11/Q4'10	Full year 2011 shipments (millions)	Growth 2011/2010
Smart phones	158.5	56.6%	487.7	62.7%
Total client PCs	120.2	16.3%	414.6	14.8%
- Pads	26.5	186.2%	63.2	274.2%
- Netbooks	6.7	-32.4%	29.4	-25.3%
- Notebooks	57.9	7.3%	209.6	7.5%
- Desktops	29.1	-3.6%	112.4	2.3%

Figure 8: Worldwide devices' shipments statistic – Q4 2011, full year 2011 (Source: Canalys, 2012)

European global leadership

The European continent is leading the process of creating telecommunication industry standards.

As an example can be used effort for common handset chargers to improve energy efficiency (The European Mobile Manifesto, 2009). As well as an adaption of GSM standards, the LTE networks development will have the same positive impact on the mobile device to create powerful and useful piece of apparatus (Europa.eu, 2009). In the appendix 3, the reader can find mobile broadband penetration by region, per 100 inhabitants in 2010, on the other hand, the 3G Penetration Inflection Points in selected regions which are shown in appendix 4 are giving us knowledge and comparison of how much are these networks developed across the world.

US market

In the American market, the mobile industry has become an unexpected phenomenon. What is important to mention is that “the population is using mobile devices to perform retail-related activities while in a store, bridging the gap between the physical and digital worlds” (comScore 2012). It is already causing a competition across the local businesses since the customers adopted this behaviour of using mobile as a comparing tool. It is a challenge to win this war of customer, Czech and especially English retailers should carefully watch and inspire in adoption of these upcoming changes within the retail industry. As written in comScore (2012): ‘retailers that fail to address this shifting shopping paradigm in 2012 risk losing money as savvy Smartphone shoppers become a reality across many global markets’.

Japan

Baldi (2002, p6) is stating that ‘50.8% of the Japanese population owned a ‘keitai’ (mobile phone) in early 2001, which is equivalent to 72 million users’. It is almost unbelievable to consider how much of great step forward they were able to make according to adoption of mobile commerce in the past ten years.

It is the only market where the expectations were met with real results. Mizuko (2006) offers the explanation: the success lies in following a different strategy – iMode system launched by the biggest operator NTT DoCoMo, which focused on entertaining services rather than on professional business services, which were a European interest when adopting WAP’. There are also opinions that it was enabled just because of specific Japanese society.

3. METHODOLOGY OF COLLECTED DATA

3.1. Research approach and strategy

We can categorise research approaches and strategies in many ways according to numerous textbooks available (Schindler, and Cooper, 2008; Ghauri and Grønhaug, 2010; Blaxter, Hughes and Tight, 2010; Bryman and Bell, 2011). As Blaxter, Hughes and Tight (2010, p54) stated, ‘Different kinds of research approaches produce different kinds of knowledge’ about area of study’.

When collecting data, the most common research strategies used are quantitative and qualitative strategies. The quantitative is empirical research where ‘the data are represented by numbers’, and is seen as a stronger basis for collecting data than the qualitative strategy. Qualitative research is a competing alternative to the previous term – the data are not in form of numbers and we are ‘creating hypothesis’ and testing them focusing on results of empirical study or interview conducted (Bryman and Bell, 2011).

“The main difference of these two strategies lies in form of data”(Blaxter, Hughes and Tight, 2010). I decided to carry out research combining both qualitative and quantitative strategies. My integration of these two models can be described in following way: in the first step I started with exploration of available secondary data; the questionnaire survey is an intermediate step before the deepened and assessed qualitative discussion and conclusions. It was considered that the decision of conducting both research methods will first result to more appropriate data.

When deciding about process of collecting data it is again a combination, either ‘fieldwork’, but mainly ‘deskwork’, because the major part of questionnaire was answered using an online tools. Fieldwork couldn’t be done in the Czech Republic because of the lack of the time when the writer was physically in the country.

Good research is based in well managed reasoning. The reasoning process can be combined in systematic way by induction, deduction, observation and hypothesis testing (Schindler and Cooper, 2008, p30). The difference of these approaches is in the relationship between research and theory. Deduction is ‘form of argument that purports to be conclusive – the conclusion must necessarily follow from the reason given. Inductive approach is radically different and our conclusion is based on more particular facts or pieces of evidence’. In this work I decided to apply a deductive research approach by using a theory, which will support

my explanation of the collected data and conducted analysis. To support to this decision I will cite words of Bryman and Bell, (2011, p32): “a deductive research approach is used when collecting quantitative data and evaluating the pros and cons”.

3.2. Methods for data collection

First of all it is important to differ the term ‘method’, which can be defined as a particular tool for data collection and ‘methodology’ which refers to approach which underpins our study (Schindler and Cooper, 2008).

In research, we can gain information from two different types of available data: primary and secondary data. The first step is usually a reviewing of the secondary literature such as ‘articles, books, journals, which already exists and has been collected by other researchers or writers’ (Buglear and Fisher, 2007). It is more efficient to obtain new knowledge through primary data collection than accepting an previous researches. Obtained primary data are usually in form of surveys or experiments. It is becoming more common to use mixed methodologies (Ghauri and Grønhaug, 2010).

Buglear and Fisher (2007) suggest two main sources when reviewing our literature and divide the secondary data to external and internal. According to the better accessibility of external data such as books in the libraries, journal articles or and annual reports I decided not to consider internal data. I believe that internal data would provide me with more useful and detailed information, but these types of data are required mostly when carrying out work about particular company and we need to analyse its internal resources. To access journal articles I used online ‘Summon database’ of the University of Huddersfield and variety of available books in the university library.

In the chapter about research design, Schindler and Cooper (2008) define four approaches available to use in our research: Action research, case study, experiment or survey. According to its definition: ‘with a survey we are observing systematic knowledge in order to get consistent results and conclusions on the aims of the study’, I decided to collect empirical data this way.

Research techniques used were online or paper based questionnaire, which provide me with information about people classified as a target group.

3.3. Questionnaire survey

Dr. Phill Garland (Openforum, 2012) presented a list of stages to be considered during the development of a survey. During the process of questionnaire design I come through all these stages and description of each you can find in the following paragraphs.

Above mentioned stages of the conducted survey are:

Objectives definition

At the early beginning, after establishing the main purpose of the survey I stated its objectives which are related to the overall purpose of this thesis. To support my knowledge, empirical data were collected from books and articles, because the m-commerce is a relatively new aspect of commerce.

Define targeted group

At this point, it is important to decide which population we are going to target. This stage must be done before moving on to the design of the questions. It was agreed to demographically target only selected group of individuals in the Czech Republic and the United Kingdom. This was done to narrow the target group down and find specific answers which would be helpful in process of analysing the mobile commerce development in this area. I decided to conduct a questionnaire survey with at least 100 people from both regions, primarily in the age group 18 – 35 years old.

According to figure 9, with the gender proportion 60% males against 40% females, the survey was answered by **211 respondents** from both countries. Specifically it was 110 individuals from the Czech Republic and 101 from the UK. In addition, exact number of male respondents was 125 and 86 were female. Because the questionnaire was answered mostly online - most of these users were young. It is clear when looking at the figure 10 that the age of respondents is between 18-35 years that surpass almost 70% of respondents. "

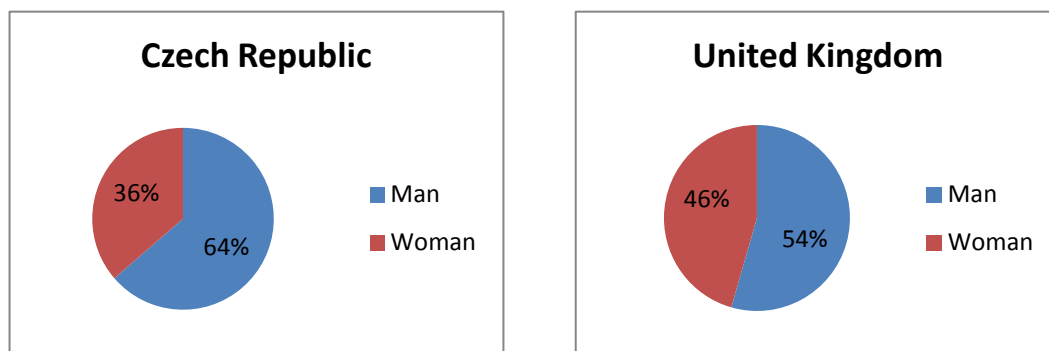


Figure 9: Gender of respondents in both countries (Source: author)

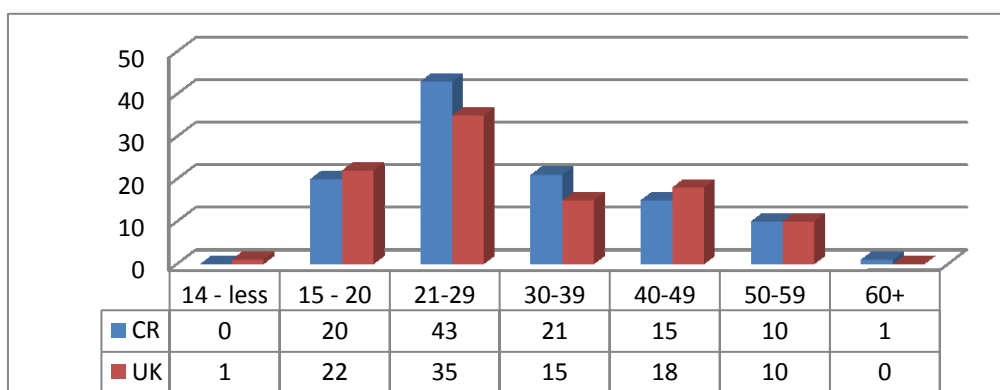


Figure 10: Age groups of targeted audience (Source: author)

Design stage

We should take into consideration statement of Peterson (2000), when designing the questionnaire questions: ‘One of the objectives of a survey is to minimise the errors that may arise when creating questions’. Understanding this, I was then able to try and select questions which I felt users would be able to answer and design in convenient and easy form. The important aspect was considering the time of filling in the survey, as people tend to skip long questionnaires or questionnaires with the open questions. My questionnaire only included 17 questions. There were no open questions, but where it was appropriate I gave the interviewee’s the possibility to put their own opinion. The pre-tested average time for filling in the questionnaire was around three minutes.

I divided my questionnaire into three parts. The first part included general information (the age, gender) about the individuals or how long they have been using mobile phones. These questions help to understand which sex uses mobiles more, what is the average age of device and other important aspects for making conclusions. The second part contains questions about the popularity of mobile commerce services, problems which are the users facing with and how they would react. This was the main part of the questionnaire - to get country specific

answers regarding popularity of services and mobile usage. The final third part was designed to find out people's perspectives regarding the future of m-commerce.

The survey questions are attached to the thesis as Appendix 5. The questionnaire was delivered in two mutual versions in order to get responses from all interviewees, because not all Czech know English and also to divide audience and afterwards it was easier to compare results.

The measurements

To collect the answers I decided to use a free tool from Google called 'Google forms'. It is a cloud service, which is recommended especially to students as a free way of deploying the questionnaire survey. After the questionnaire was created and designed it was distributed around selected websites and forums as well as directly sent as an email to students in selected fields of study. The questionnaire was posted to people in format of "bit.ly" link. This provided me with another statistical tool to see which method of asking people was the most successful. Regarding to Czech answers 50% of them came back from forums or technology pages, next parts of pie are composed by direct queries with 30% of responses and social networks such as 'twitter', 'google+' with around 20%. I used as well forms of 'QR codes', which bit.ly service enable as well, this mainly to see the real abilities and usage of this form of delivering information however it wasn't exploited according to bit.ly results neither in the Czech republic nor in the UK.

The pre-test stage

It is highly recommended according to several authors (Peterson, 2000; Flick 2009) go through several pre-tests, which can identify difficulties and confusion that can appear when answering the questionnaire by targeted interviewers. Before addressing the questions to selected audience I chose a small sample to find out if I need to change design or modify some of the questions. 'Revising, testing, and improving the questionnaire is key before launching a large-scale research study, and failing to do so may cause the study to be unsuccessful' (Brace and Market Research Society, 2008).

I addressed the pre-test for both language versions. After the pre-test of the questionnaire, these changes were made:

First of all, there was a problem with the question "How long are you using your mobile phone?", where people were confused if I mean actual phone, or if I am asking how long they are users of mobile phone in general. This question was afterwards transformed to "How

many years have you been using a mobile phone?” In the question “Which type of operating system does your mobile phone have?” I added a menu where people can chose from the list of operating systems or just simply say I don’t know or ‘other’. This was changed after realising that people would not write this answer, and is better to provide them with options. Other important changes were made, for all just two additional:

- Stating promises of full privacy when answering the questionnaire,
- modification of the design of the questionnaire in order to differ from the English and Czech version

People in the pre-test groups were native English and Czech speakers in order to get views on clarity of the questionnaire. After conducting the pre-test I was able to eliminate confusion, grammar mistakes and provide people with clear questions. People in the pre-test provided me as well with the time limit for the completion of the questionnaire, what was around three minutes as planned in the design stage.

Data analysis stage

After all of this was done, the data from the sample survey were collected and analysed. Microsoft Excel was used as an analytical tool in order to create the graphs and statistical measurements.

3.4. Reliability and validity

When conducting a business research, it is important that our data are reliable and valid. Joppe (2000, p1) gives for validity the following explanation: “Validity determines whether the research truly measures that which it was intended to measure or how truthful the research results are”. Nobody can guarantee a consistent reliability in his results, but as stated in previous paragraphs I made effort to do so by reviewing available literature and trying to limit possible errors. The differences in results can be caused by the direct and indirect changes in interviews attitudes, knowledge or actual mood of individual.

At the end I would like again to underline a couple of statistical pieces of information about the survey in addition to targeted group description. The sample of this survey consisted of 211 individuals, 110 from the Czech Republic and remaining 101 from the UK. Demographical characteristics of this research primarily focus on the age group between 18 and 30 years old, when 172 out of the 211 respondents, correlating to 83.71%, belongs to this age group. The genders of the respondents were as follows: 125(60%) male and 86 (40%)

female. The survey was conducted partly as an online survey, where 160 answers were received, and partly with paper questionnaires conducted at the University of Huddersfield, where 51 answers were gathered. The survey was conducted over a week period in February 2012.

4. RESEARCH RESULTS AND ANALYSIS OF SITUATION IN THE CZECH REPUBLIC AND THE UK

The purpose of this part of the work is to summarise the data and the results that were collected in both countries, which will also be supported with related secondary data. Before I finally move to the comparison of the responses of the Czech and English individuals, according to the research carried out by OECD (2011), in figure 11, we can see the differences in the level of usage of mobile phones to Access the internet in the year 2010. The Czech Republic is just one place from being the last one in this rating, meanwhile the UK is at the top behind Norway, Luxembourg and Sweden. In the discussion part of this paper, I will try to identify the reasons of these differences, however in this chapter; I will show more specific results according to the results of my survey to investigate an actual situation.

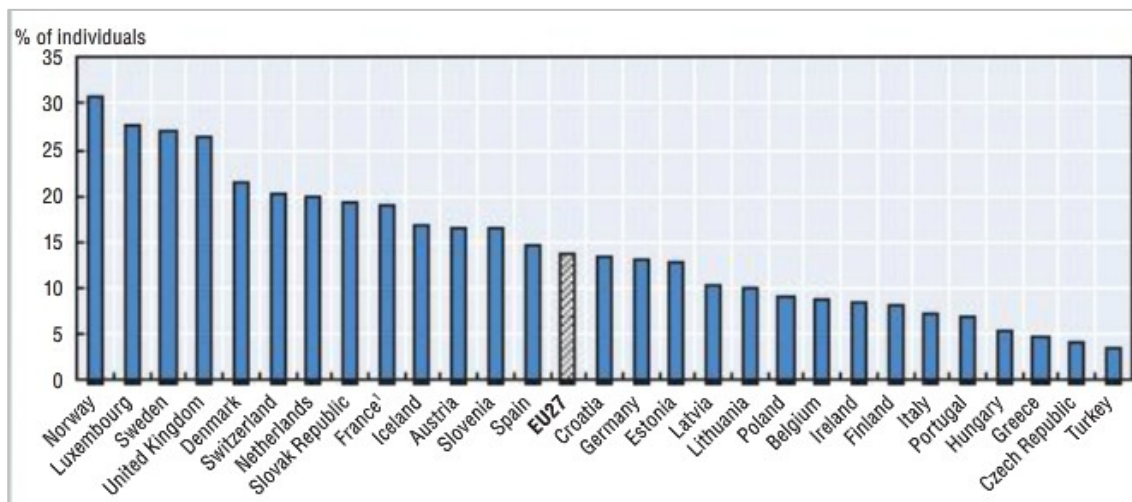


Figure 11: Usage of mobile phone to access the Internet in selected OECD countries in 2010 (Source: *oecd, 2011*)

4.1. Questionnaire results

As stated in the methodology chapter, the design of the questionnaire was adjusted to obtain useful answer from the both country-specific respondents. To present data in an understandable way, it was decided to provide readers with graphical outcomes rather than describe statistical data. I will combine both approaches, while selecting appropriate types of graphs and dividing the work into three main areas of interest. First of all, I will start with general questions, then move to questions concerning the popularity of mobile commerce services and at the end, the reader will be provided with the answers according to the future trends and limitations. As a summary of the results, it was decided to create a table where I

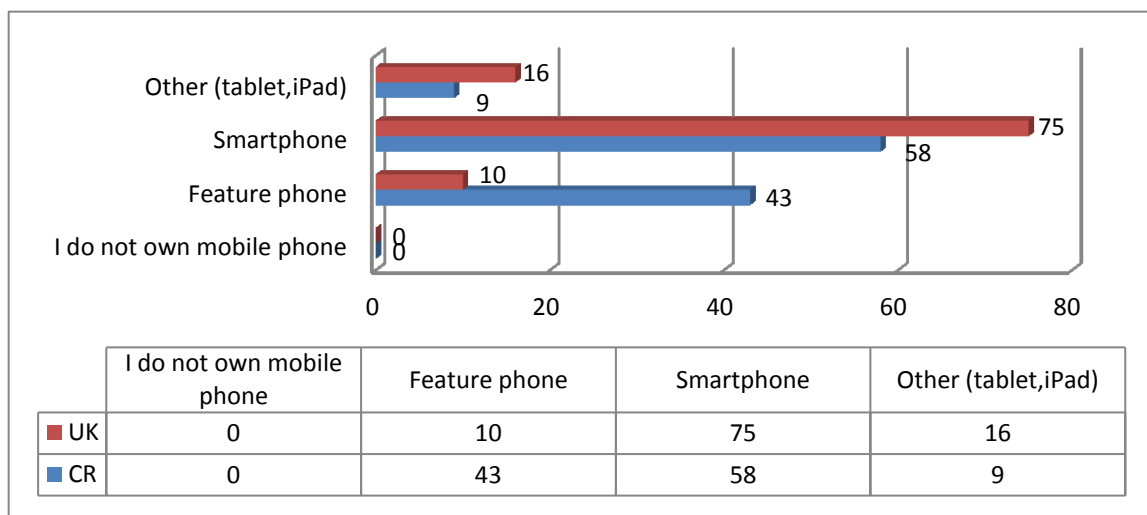
will not only consider the results from the questionnaire, but as well comment on the environmental aspects in both countries.

In some cases the data was transformed as we can see in figure 14 to provide us with better information about the differences in both countries.

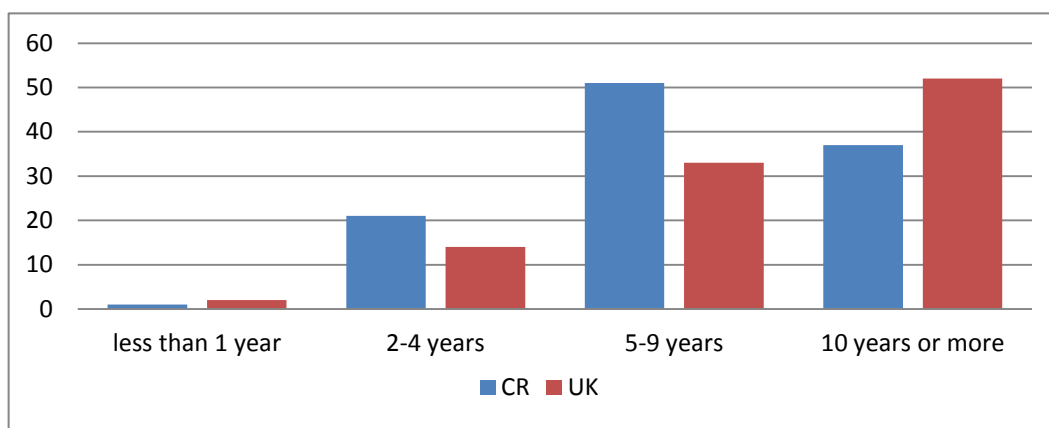
A: General questions

In this part I compared the types of devices on both markets as well as asking respondents to provide me with information such as: how long are they actually using mobile phone or what is the frequency of buying the new mobile phone. In the following three graphs we can see the visualised answers of what is then followed by the verbal observations. In addition the popularity of particular operating systems is compared with the results in Japan and the US according to Ofcom (2011).

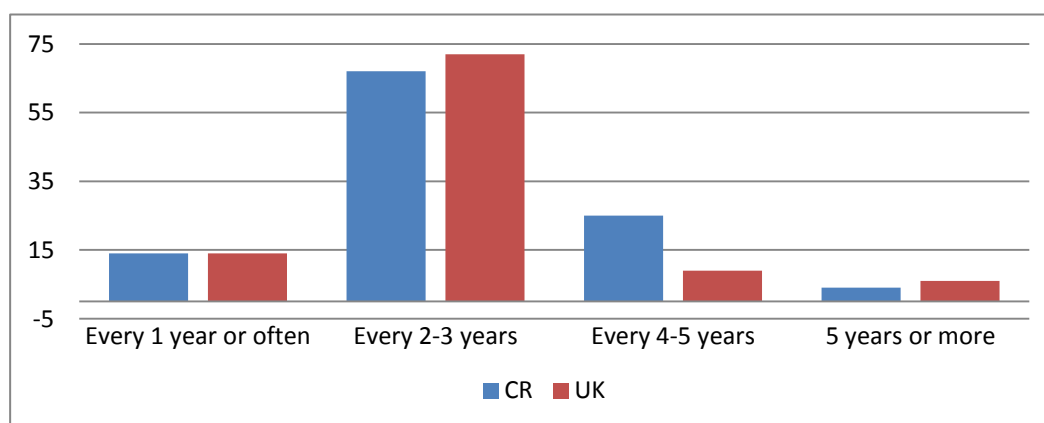
Question A1: Which type of mobile phone do you own?



Question A2: How many years have you been using a mobile phone?



Question A3: How often do you purchase a new device?



Summary of the general questions:

Almost 40% from Czech respondents still own a feature phone compared to the English 10%. There can be two main reasons for this, first of all, the price of a Smartphone is not at the level that Czech consumers would be willing to pay, or the services available for the use of smart phones are not adequate to make people convert to new technologies. In the UK, the situation is different, because of a larger competition; the operators have to drop the prices down. But what is important to notice is that there is a significant increase in trend of the Smartphone ownership.

More than 51% of the respondents in the UK started using mobile phones more than 10 years ago, whereas 46,4% of the respondents in the Czech Republic purchased mobile phone in the last five to nine years only. From this, it is clear that the more adopted market of mobile phones is in the UK. Pointing to the gender differences, in general men own mobile phone longer than women. The results as well indicating that the young men are the main group of the adopters discovering new trends in the technology. This is confirmed when we take the percentage of tablet owners, which is twice bigger in the United Kingdom than in CR.

As we can see in the question 3, people tend to buy new mobile devices every second year. This is because in general mobile operators offer mostly mobile contracts of 24 months, which ties customers to an agreement. They can then upgrade their purchase following the closure and termination of the contract agreement. The Czech market dominates three companies and the Czech customers pay for data services more than many other European countries. One reason for this may be because the structure of the Czech market and because customers tend to remain at one operator, even if other company offers better conditions.

There is little argument about the absence of European virtual mobile operator in the Czech market (Informacni institut, 2012).

While a mobile phone's hardware (processors, screen size, keyboard type etc) is important to have a good internet experience on mobile phones, the main impact is in hands of operating system (OS). We can define OS as the user interface of the device and also the applications that are developed for individual platform. There is a big level of rivalry across the platforms and they are playing patent wars, what is in fact decreasing value of the opportunities which this industry holds. In the past months these main manufacturers and software providers announced a range of new releases what makes this decision about selecting the right platform more difficult.

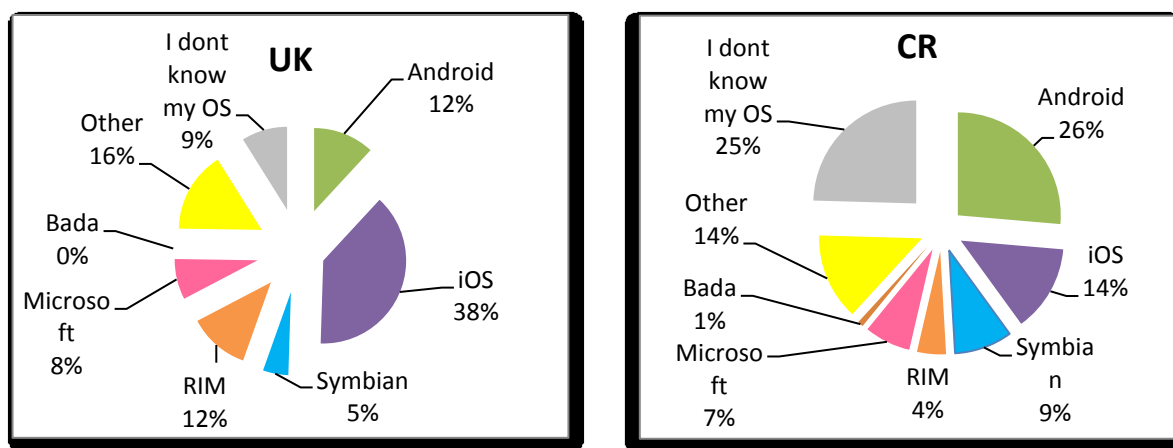


Figure 12: Type of the operating system in both countries (Source: author)

When asking this question, I was also curious about the knowledge of respondents but more than 61,9% in the CR and 75.3% were able to specify their mobile operating system. At the first sight it is quite a surprising fact, but when we should take into consideration, that people are deciding these days more according to the platform than brand of the mobile. The remaining percentage of the people which did not provide me with the information were women, which chose the option 'I don't know' or feature phone users which stated answer other.

The three pie charts in the graph 13 are her to provide us with trends within Europe in general or within the regions such as Japan and US. In the market of mobile phones there are two main players - Google's Android and Apple's iOS and 'the market is still far from being stabilised', according to research of Ovum (Startupsmart.com.au, 2012). They also labelled Nokia's alliance with Microsoft 'to be a strong competitor to the dominance of Android and

probably even better than iOS'. We can also see the trends of substitution of old standards such as Java or Flash with apps based on HTML5 standards

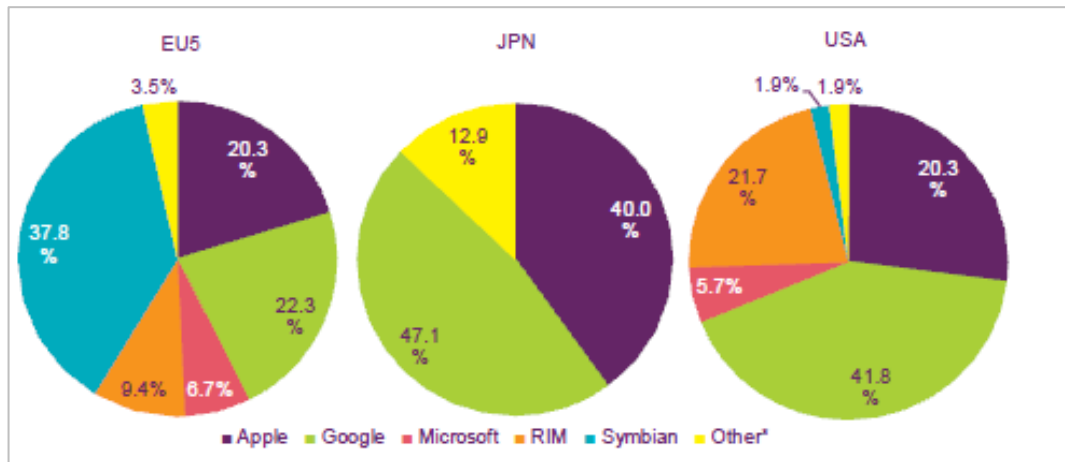
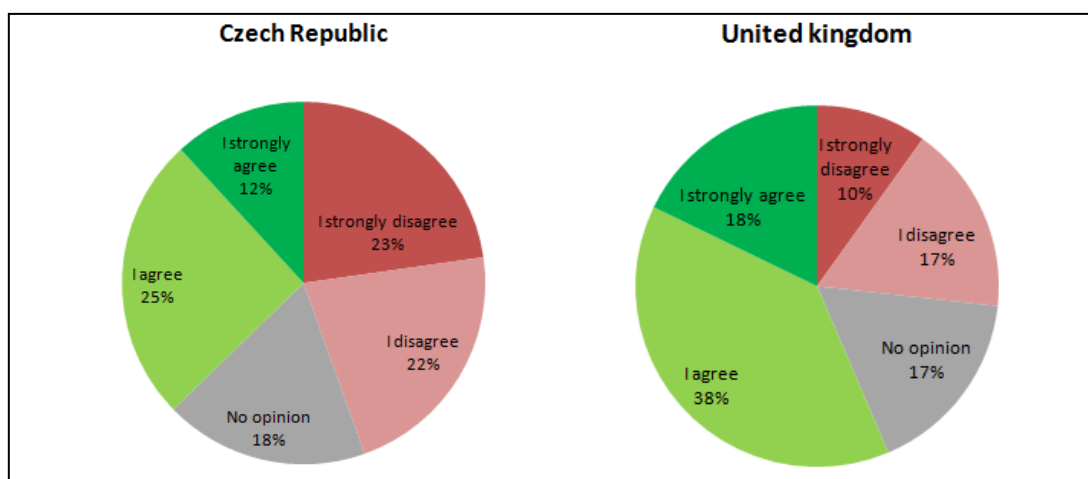


Figure 13: Smartphone platform share across Europe, the US and Japan (Source Ofcom, 2011)

B: Satisfaction with services

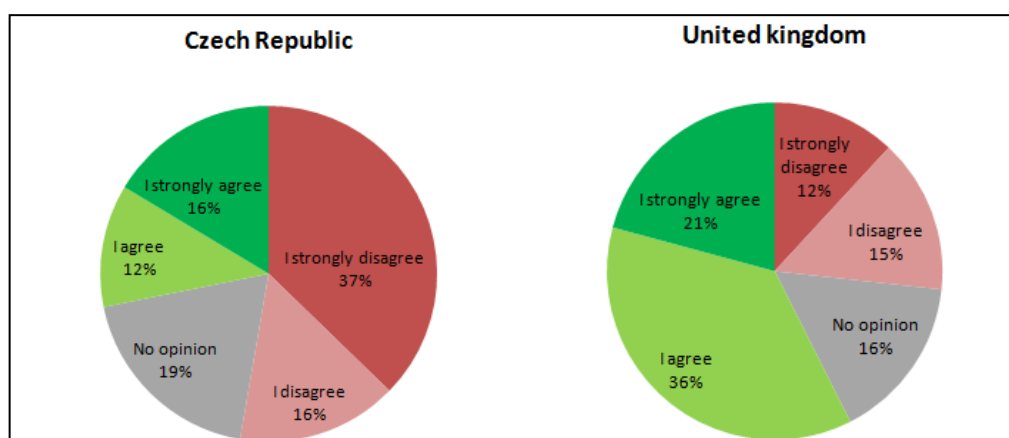
In this section I was focusing on the convenience of mobile services across both countries. I was interested about the attitudes of people when during the shopping experience. First of all I want to know popularity of purchasing through mobile, afterwards I move to the more specific questions. I want to find out how many people is actually searching through mobile information about product or service they are going to buy. The third question wants to discover how many people have adopted the price check applications for use in the stores, and if the retailers should already think about implementation new strategies to compete against these new possibilities.

Question B1: Are you satisfied with your mobile device when purchasing online?



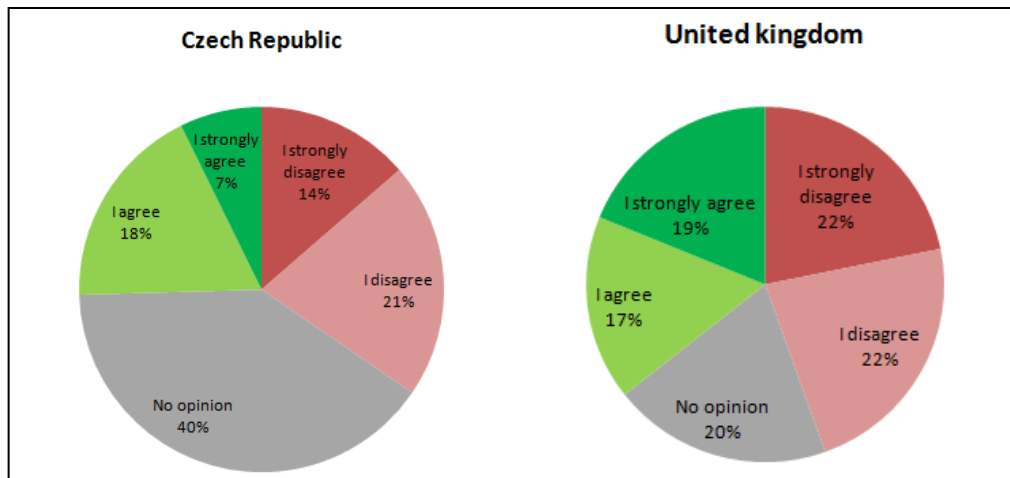
This question's results show an interest in the idea of paying for online purchases with a mobile telephone. A greater part of 56% of the UK respondents purchased online on their devices and the level of satisfaction for these purchases with their mobile telephones was high. On the other hand, Czech respondents showed a score of 45% of negative responses, and 18% without opinion also show a lack of interest or a lack of knowledge about these options. These negative numbers can be also be understood as an ignorance of Czech retailers to jump on this new wave. If we take into consideration 17 % of the abeyance Czech answers we can conclude that better results have been achieved in the United Kingdom. This is more obvious if we notice that 23% of Czech answers strongly disagree and see it probably as an insecure way of shopping.

Question B2: Do you look for information about products on your device and does it provide reliable results?



At this point I am asking if respondents currently use their mobile phone to browse product information whilst shopping is important because it applies this knowledge aspect of provided information during the shopping experience. 57% of the UK and only 28% from those interviewed in the Czech use their mobile phone for information search while shopping. This difference is more confirmed also when we look at the number strongly disagree, which means people in the Czech republic have almost never look for information through mobile device when purchasing. The findings accept higher information search-aspect of M-commerce in the UK. According to comScore (2012) mobile will increasingly evolve as a 'tool for in-Store purchases'. 'Almost every 5th person already take a picture of product during shopping', additional 15% of respondents in comScore research 'text or call in order to ask about product family member or close friends'.

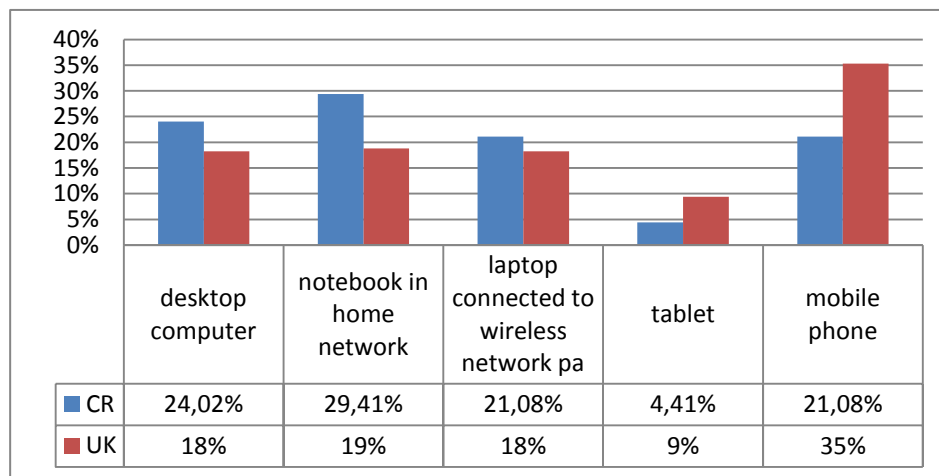
Question B3: Have you ever compared prices with an application such as "Amazon price check", "Barcode scanner" or similar?



These apps basically allow mobile users to scan product barcodes (using mobile camera) in order to find best information from web and even local stores about the price or quality. Additional functions can be search history or automatically alert people with local offers. To ask this question I was as well inspired by the researches similar to conducted by Pew Internet (2012) stating that ‘during the holiday season, 25% of cell phone owners used their phone inside stores to gather price comparisons; 24% used them to look up online reviews. And 19% of those who searched for a better price on an in-store product eventually bought the product online. If we compare these numbers with answers in question B3, we can see that it shows similar results. I wasn’t expecting 25% of positive answers in the Czech Republic; this only confirms that consumers on this market show similar behaviour as English individuals.

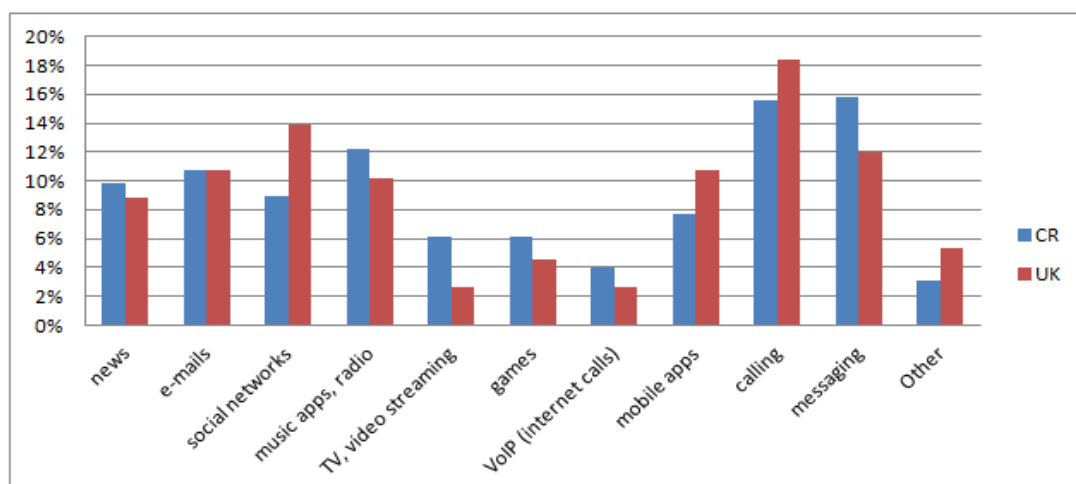
In the question B4, I wanted to know peoples’ answers according to the method of access to the Internet. The answers to this and to the two following questions allowed me to closely investigate my main objectives – the level of mobile usage in the both countries and as well find out which services are most popular among the users. Additional to this, the analysis was done when I transformed data from questions B5 and B6 to the ‘matrix of shopping and mobile tasks’.

Question B4: Mostly I access services such as emails, social networks, websites, via:

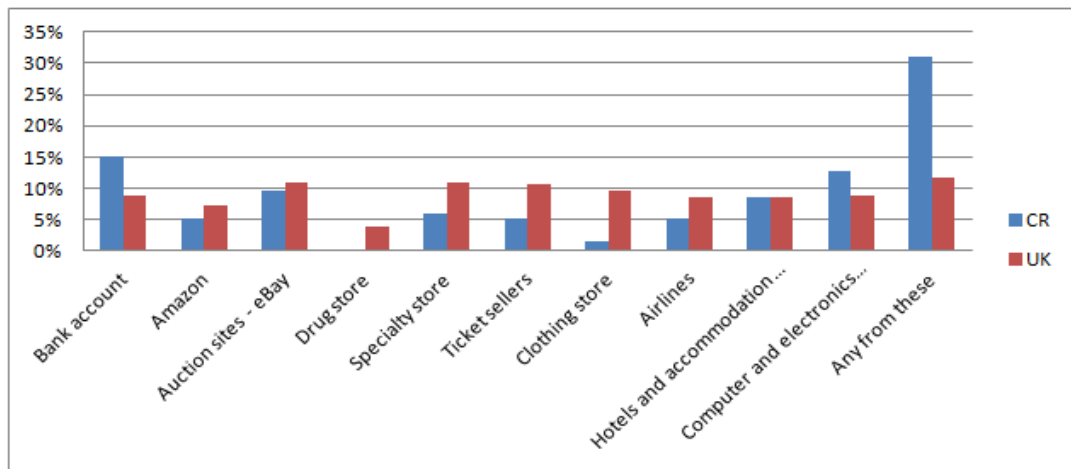


I will divide the results to this question into two separate conclusions. First of all in the Czech Republic we can see that the people are somewhere in the middle of adoption of the new trends – mobile phone access, but similarly important are the traditional forms such as laptop in the home network which has the largest percentage followed by desktop computer and public networks. Significantly different I can conclude when I take a look to 35% of mobile phone access according to British answers. It seems that British citizens start to discover this new convenient ways of consuming media, reading news and mainly checking emails without being limited by the location. However it is important to realise that decision about accessing Internet via computer or mobile depends also from the time of the day. Desktop computer can be more used during the morning and lunchtime when people are usually at work or in the university.

Question B5: Which services do you use your mobile phone for mostly?



Question B6: Have you ever used or visited any of these types of websites or applications on your mobile phone?



When we look at question B5, we can broadly define that almost all who filled this questionnaire use SMS, which is the most popular service in the Czech Republic, and on the other hand calling won as an most used service in the UK. More than 15% of British respondents consider mobile phones as a tool to access social networks and increasing popularity can be seen with usage of mobile apps. Mobile phone in the Czech Republic can be recognised as an aggregator of news.

Data in the question B6 can be again understood as an indicator of maturity level of this area of commerce which is higher in the UK. People here tend to trust services more, but in mobile banking and computer and electrical appliances it seems that these services are more adopted in the Czech Republic. Whereas, Czech customers are not attracted with other services like ticket sellers, clothing, or drug stores what is noticeable looking at option 'other' which was ticked by more than 30% of the Czech respondents.

As it was already mentioned to highlight results from question B5 and B6 I decided to make matrix of shoppers in Czech Republic and the UK (figure 14). I decided to divide mobile services into four main areas. Numbers in red represent areas where the UK is more dominant.. Noticeable is that people in the Czech Republic trust mobile banking applications, but shopping tasks have generally poor results. Traditional form of mobile services is still significant across the user base.

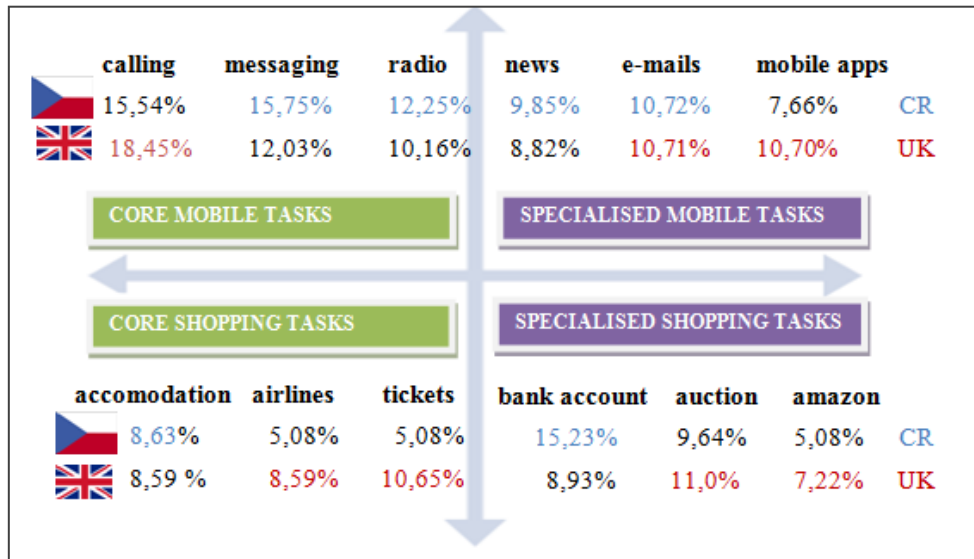
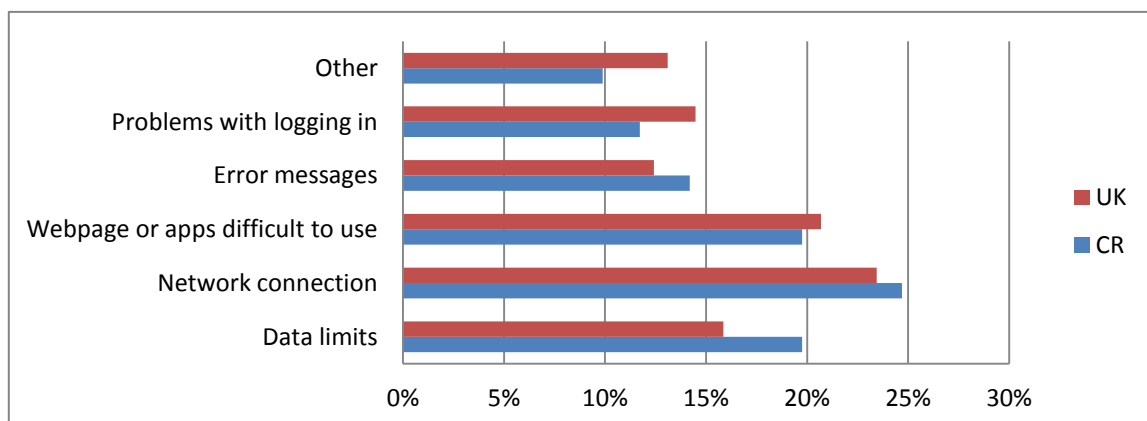


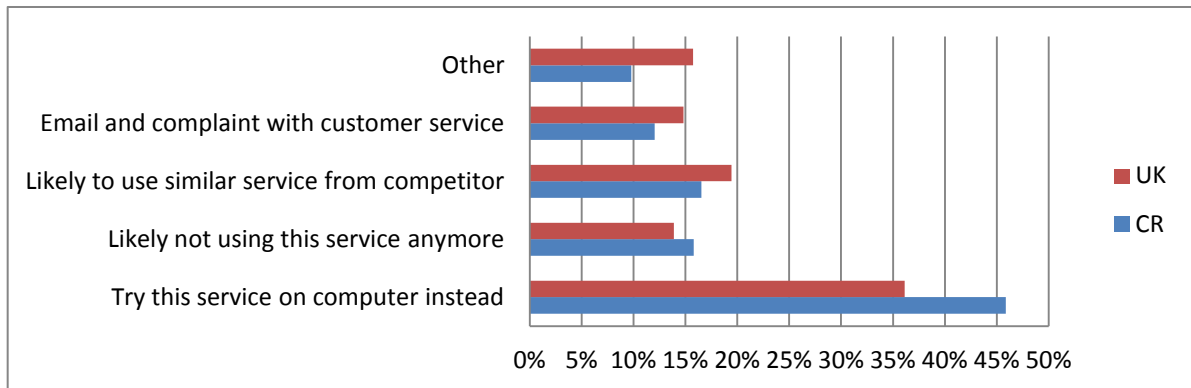
Figure 14: Matrix of particular shopping or mobile tasks and results across the countries (Source: author)

I tried to specifically address in question B7 the possible problems which can occur whilst accessing the internet or making a transaction using the mobile device. This problem is linked with question B8 where I am trying to find out the possible reactions of users according to these negative challenges of unreliable technology. Around 25% of Czech and 23% UK respondents see the main problem in – network connection troubles, when they use their device. The most common issue for both countries respondents were difficult webpage or app, data limits and error messages.

Question B7: Which problems do you face using mobile services?



Question B8: How would you react to difficulties with your mobile service



The majority of the users would use services on the computer what is represented by 46% responses in CR and 36 % in the UK. The aim of this question was to point out that negative mobile experiences can potentially affect the relationship of customer with particular business. From this reason if the company decide to support offline business model with mobile commerce, they need to have well designed interface as well as secure and accessible services.

C: Future trends

In the third and the last part of the questionnaire I asked three questions, two with the aim to find out peoples positive or negative attitudes to this new technology, and the question C3 was aiming to discover the weakest sides of m-commerce according to users.

In the questions C1, the interviewers could answer ‘Yes’ or ‘No’, additionally in the question C2 I add option ‘Other’, where they could provide me with more detailed answer.

Question C1: Would you be interested in paying for items with your mobile phone for in store purchases?

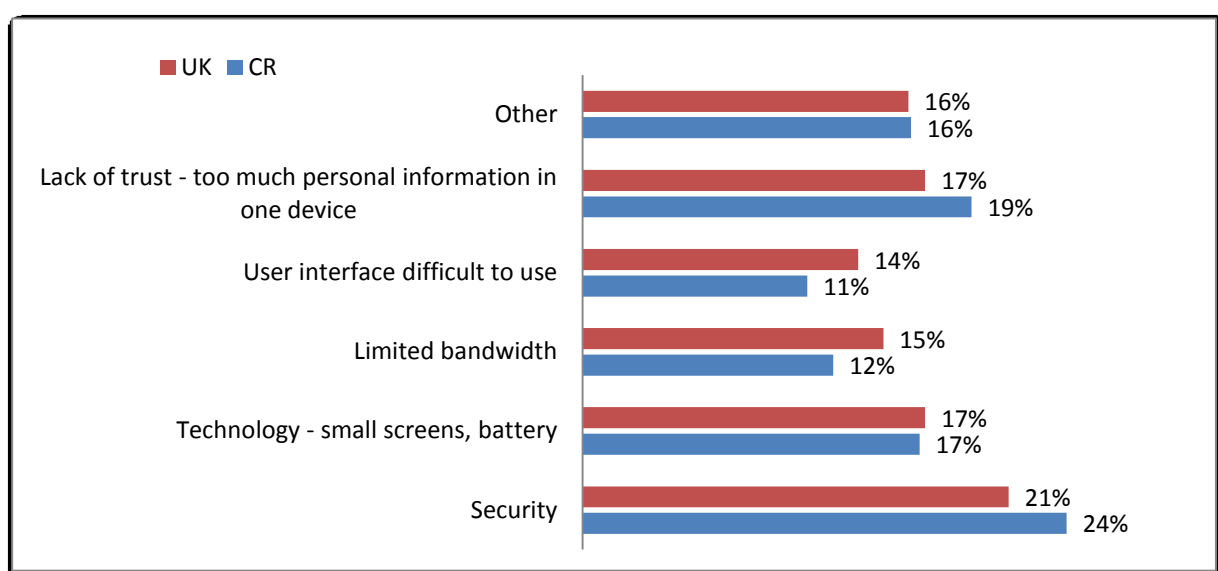
Question C2: Would you expect that mobile transactions would be easier than offline, or on desktop computer?

The first question – C1 was met with majority of positive answers, 65% in the Czech Republic and 54% in the UK. We can feel that there is a possibility for NFC technology became more popular than credit cards, but at this time people’s knowledge about this types of payments is not wide as well as charges according usage of this types of payments could

cause the negative answer. More positive perception of the Czech interviewers was acknowledged as well in the second question where they answered negatively only in the 40% of cases and in the UK was the percentage of negative answers little bit higher – 43%. Even though people prefer to use desktop PC or laptop when purchasing rather than mobile in the future we can see new drivers of change which will make mobile purchases easier, preferable and convenient. Examples of these can be – transparent pricing, when customers will be provided with instant information based on their search; localised discounts based on customers' behaviour tracking or OTA (over the air) content delivery.

When talking about all this new opportunities for retailing, it is also important to underscore the constraints of adopting this technology across the users. Perhaps the most important challenge is to proof security across the customers, because resulting from the last question with number over 20% of respondents in both countries it is understood as a main negative constraint. This is linked by worrying about personal data stored in the device and technological constraints such as battery performance, small display or keyboard. From additional answers recorded from the customers it was as well lack of trust in the applications developed for certain purpose or prices for data connection and mainly expensive data roaming, when the user wants to exploit services abroad.

Question C3: What would you say are the constraints of mobile commerce?



4.2. Analysis summary

Taken together, table 6 presents and simplifies analysed data and also adds secondary data information in order to provide comparison of both countries.

Table 6: Résumé of the researched areas (Source: author, adopted from Baldi and Thaung, 2002)

Key success factors	Potential	Comments	United Kingdom	Czech republic
TECHNOLOGY				
Devices	SMARTPHONE AND TABLET ADOPTION	The mobile devices sold in the UK and Czech republic are comparable in terms of their technical features	<i>Smartphone dominance</i>	<i>Feature phones</i>
Networks	LTE	First adoptions of high-speed networks in Europe	<i>Highly-adopted 3G networks</i>	<i>Low coverage with 3G broadband</i>
Mobile apps and webpage	HTML 5	This technology can bring more affordable smart phones in order to catch the audience with similar services	<i>Apps</i>	<i>WebPages</i>
Mobile operators	AGREEMENTS BETWEEN OPERATORS	Cooperation will allow to build networks faster with less cost	<i>Concurrency leads to better services</i>	<i>Need more interaction of regulator</i>
MARKET STRUCTURE				
Originator of phone specification	STANDARDISATION OF THE TECHNOLOGIES	HTML 5 is able to run in already existing hardware	<i>Numerous players – design is important</i>	<i>Loyalty in older brands such as Nokia</i>
Billing and pricing	WI-FI NETWORKS	Consumers tend to prefer usage of wireless networks because of problems with accessing Internet through mobile broadband connection	<i>Unlimited data</i>	<i>FUP restrictions</i>
CULTURAL BACKGROUND				
Attitude towards time	LOCALISED APPS	Different tastes for services depends from the age group	<i>Spending time travelling or in public places such as restaurants</i>	<i>Home or active holiday</i>
Commuting habits	‘KILLING TIME’ APPS	Possibility of adaption these	<i>Car as a main form of</i>	<i>More public transport</i>

Role of phone		services while travelling	<i>transport</i>	<i>oriented</i>
	SHOPPING TOOL	Increasing value of the mobile devices as a 'shopping assistant'	<i>Necessity of lifestyle</i>	<i>Communication tool</i>
CONSUMER GROUPS				
Kids and teenagers	'SOCIAL GAMES'	Growing up in the wireless environment	<i>Games where communities are important</i>	<i>Fascinated users</i>
Young adults	LOCATION BASED SERVICES	This age group is considered as the main technology adapters	<i>Social networks</i>	<i>Media consumption</i>
Business users	BUSINESS APPS AND NEWS AGGREGATORS	Need to have anytime anywhere access	<i>Tablet users</i>	<i>Desktop users</i>

5. DISCUSSION AND RECOMMENDATIONS FOR THE NEXT DEVELOPMENT OF MOBILE COMMERCE AND ITS NEXT EXTENSION

5.1. Discussion of the issues of conducted research

The role of operator in mobile commerce

The reason why I speak about the telecommunication sector at the beginning of my work is because the role of the mobile operator has a significant role to play in both countries. When customer buys a smart phone, they are forced to pay the data fee to be able use all the features of the device, what represents repeated income for the operators. In some countries we can also notice efforts to narrow down customer's freedoms by blocking internet calls, because mobile operators are losing their revenues. The European legal structures should control this forces and leave on customer decision how is he going to use the mobile network. This explains why I included the legal changes to the commerce environment in my work.

Instead of such reaction to these rapid changes to the industry, mobile operators should change their business models. They should start to build loyalty with their customers by similar benefit programs which already work, for example, in the transport sector. Main operators in each country are, and as well they should be cooperating more often. It is very expensive to build for example LTE networks, this agreements on cooperation would save them cost when creating better infrastructure. Low interconnection charges should be broken down, because I understand these as a need in increasing importance of mobile commerce across the European continent. Downloading data via a mobile phone while in another EU country should not be more expensive for a consumer than downloading data at home. I will try later to give recommendations on the topic oriented to mobile operators and try to comment actual situation in both countries.

The survey

When constructing the questionnaires, it was important for me to consider the ethical principles as so to avoid any discrimination or prejudice. I ensured that the questionnaires were specific to all age groups and both genders, and that I gained peoples' consent to use their information. I maintained their confidentiality and respected their individual rights in line with the data protection act 1998 (Legislation.gov.uk, 1998) – conforming to my duty in order to preserve individual rights and show respect and consideration.

The sample size was decided with considering the limited time of the research and processes which are related with collection of the data as for example reviewing the available literature. People who answered to my questionnaires were represented by two nationalities, which were provided with two language mutations of the survey. The language differences could make sound some questions slightly different, on the other hand if I would provide Czech interviewers with the same English version; this could bring even worse problems or even discourage them from answering the questions.

There was an initial proposal of conducting interviews with people from the researched area or individuals running business which can be seen as the great examples of implementation of mobile commerce services. I contacted by email several persons, from companies which I believed would support my knowledge when conducting interview. According to limited word limit and as well wide area of secondary literature research I decided not to include this to my work. During my studies I took part in different visits to companies such as Cisco and Microsoft, where we personally met people who in few cases provided me with information as for example 'Microsoft tag' technology by which I could better understand these areas of secondary research.

5.2. Recommendations

The history of mobile phones began approximately in the 70th the 20th century, however to the Czech Republic arrived almost twenty years later. Nowadays we can see that these services become an integral part of the Czech society. The information society in the Czech Republic is still lagging behind in comparison to general developments in the UK, and for most of the benchmarking indicators it is below the EU average. Mobile market is not effectively competitive, because CTU does not fulfil its statutory function of protecting consumers and improving competition. This results in oligopolistic behaviour of Czech operators and the second lowest proportion of investments in their networks in European union. and the worst 3G network coverage in the EU as we can recognise in appendix 6 (Informacni institut, 2012). The Czech government must take steps to remedy leading to lower prices of mobile services in the country.

On the other hand UK offers the lowest prices for all five baskets when looking at the 'weighted average' of single-service pricing, and for three of the five baskets when looking at 'best-offer' pricing. Mobile broadband prices in the UK were the second lowest after Italy. Ofcom (2011).

New Ofcom research reveals the extent to which the UK has become addicted to smart phones, but more than 60% of UK consumers have concerns about their personal privacy online and how their personal data are used.

My work has thrown up many questions which need further investigations but what I already can declare, are the challenging changes which are happening for example looking at user interface (figure 15). People rapidly adapted to these new devices and they consider them very conventional when consuming content available online.

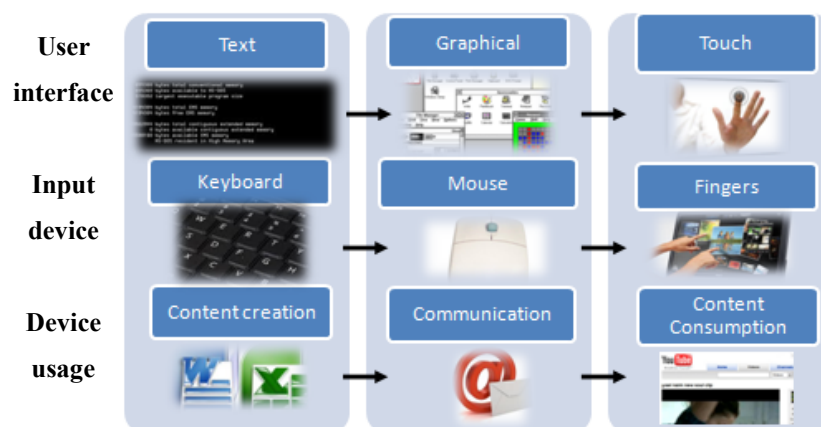


Figure 15 : User interface and device usage evolution over the past years (Source: Morgan, 2011)

Debate should also be moved forward in order to better understand the advantages of standardised HTML5 applications. From the research is evident that in the United Kingdom audience adopted mobile apps with popularity, and they are providing users with best mobile experience. By now these applications are available only through marketplace of particular platform – Android and its Google Play, iOS and its Appstore. World Wide Web inventor, Tim Berners-Lee in his talks once said: “The choice is the new platform being a privately owned walled garden, or a competitive open platform. Both models can work in the medium term. But the open model opens up new things which we can only try to imagine” (W3.org 1989). Mozilla & Telefónica are cooperating to make this open model evolve by HTML 5 based apps. They want to create an open platform ‘that provides full control of mobile devices to web applications’. This technology can work on already existing hardware, run applications for calling or messaging and it can bring affordable smartphone for the markets, what I would see as a great opportunity for adoption in Czech Republic. Telefonica, 2012.

For the next research it would be interesting to compare experiences of individuals within the same group according to usage of marketing tools such as mobile tags and others.

This technology offers a marketing opportunity for brands and their agencies to interact with potential and existing customers. Description of this marketing tool can be found in appendix 7. ‘These two dimensional barcodes can be applied to almost any surface and the information contained within them can be leveraged to create incentives and drivers that lead consumers along the purchase path (PSFK, 2011)

6. CONCLUSIONS

6.1. Research summary

This assignment has explained the increasing importance of mobile commerce as it creates new possibilities for consumers in these two evaluated countries. Situation on the mobile device's market, with increasing adaptation rate of smart phones, results in a great opportunity for commercial use of these services in both regions.

The study provides additional support to collected data in the practical part, by theoretical base, where I was looking at the historical developments of technologies which are interrelated to this area of commerce. I tried to bring a general view of all of other aspects of m-commerce due to the changes, which origins result from the adaption of new technological possibilities or creation new security and liability frameworks. Before I moved to actual questions and the main purpose of the research, I wanted to bring closer the situation in the countries who are the leaders in adoption of this business model. Development in European countries should find inspiration and as well collaborate more with partners outside the continent to adapt these new possibilities and advantages and move the process of purchases and moreover mobile usage alone a step forward.

Returning to the question concerning the level of mobile usage in the Czech Republic and the UK, posed at the beginning of this study, it is now possible to state that, mobile broadband is now used mainly for banking, payments or news aggregating in the Czech Republic and auctioning, ticket booking, location-based apps, social networking in the UK. Study also confirms previous findings according the popularity of mobile commerce in buying and selling goods and services and contributes additional evidence. More and more purchases were actually checked before the customer decided to conduct the purchase. Owning a mobile phone with internet access is in fact revolutionising our economy knowledge by delivering information about demanded goods or services.

The findings which resulted from the survey were considered as quite expected when we take into account the historical development of technologies, the size and maturity of the market and as well differences in the costs of that usage of services. However we can find some surprising findings, which just confirm that technology in the Czech Republic is expanding and these services are meeting the Czech customers with success. The part questionnaire which was focused to the future, according to these results suggests that these technologies

will not be much convenient in the future; however people admit that services such as NFC payments can have relevant impact to the methods of payment.

Taken together, these findings are telling us that mobile commerce services are already providing consumers with certain amount of information while they are making purchases and businesses should accept this fact as a start of new challenges. Significant business opportunities are opening for companies which want to provide their customer with value-added services to a customer on the move. On the other hand there can be a negative impacts for example in store purchases, when customer before purchasing get a detailed information about where he can find better value or price. The forces which are driving whole process are the mobile device manufacturers and network operators, which however have to start to rethink the actual revenue models of their services. This research does not confirm the decreasing usage of sms and calling services, but it was because it was not asked how the individuals actually send messages or use the voice services. I believe that in future years calling through 'Skype' and similar services and either using applications such as 'WhatsApp' to send free messages across the internet will decrease revenue of the operators. What is however interesting to notice is the difference of paying for services in contrast with 'fixed network users'. Desktop users expect to have everything for free, if we take a look on the mobile user, he does not mind to pay for downloaded application, game or even allow to be charged when paying with his device in the store.

6.2. Recommendation for further research

However more research on this topic needs to be undertaken before making more detailed and specific conclusions, the study has opened up the possibilities for M-commerce as an important future player in business models adapted by companies in both regions. This is just a beginning of endless services which will be available in the future when the smart phones, and more important, tablet adaptation will reach its assumed numbers. It will also bring new problems as the security of users and other areas tied with the fact that mobile phone will contain great amount of exploitable information. The aim of this work was not to discover all the negative impacts or weak sides of this type of commerce or the possible disadvantages. I tried to point out few of them, so I recommend concerning this areas as a focus of the future researches. The new era will also bring new types of application, or even completely retransform the model of actual ones. Further investigations can be also done to the marketing and payment areas of the mobile environment as well as consider using a different approaches of the research.

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Abbreviations

3G - Third Generation

CD - Compact Disk

CDMA - Code Division Multiple Acces

CR - Czech Republic

CTU - Český telekomunikační úřad (Czech telecommunication regulator)

EDGE - Enhanced Data for GSM Evolution

EU - European Union

FUP - Fair Use Policy

GPRS - General Packet Radio Service

GPS - Global Positioning System

GSM - Global System for Mobile Communication

HTML - Hyper Text Markup Language

ID - Identification

IMEI - International Mobile Equipment Identity

ISP - Internet Service Provider

LTE - Long Term Evolution

MMS - Multimedia Messaging Service

NATO - The North Antlantic Treaty Organization

NFC - Near Field Communication

NGA - Next Generation Access

OECD - Organisation for Economic Co-operation and Development

OS - Operating System

OTA - Over The Air

QR - Quick Response

SIM - Subscriber Identity Module

SMS - Short Message Service

UK - United Kingdom

UMTS - Universal Mobile Telecommunications System

UN - United Nations

US - United States

WAP - Wireless Application Protocol

WIPO - World Intellectual Property Organization

WTO - World Trade Organization

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V Ostravě dne 11.5.2016

Martin Rohal

jméno a příjmení studenta

Appendices

Appendix 1: Czech telecommunications statistics

Appendix 2: English telecommunications statistics

Appendix 3: Mobile broadband

Appendix 4: Mobile commerce in Europe

Appendix 5: Questionnaire design

Appendix 6: 3G coverage across the European countries

Appendix 7: Mobile tags